

South African Medical Journal

Organ of the Medical Association of South Africa



S.-A. Tydskrif vir Geneeskunde

Vakblad van die Mediese Vereniging van Suid-Afrika

Incorporating the South African Medical Record and the Medical Journal of South Africa

REGISTERED AT THE GENERAL POST OFFICE AS A NEWSPAPER

Vol. 27, No. 18

Cape Town, 2 May 1953

Weekly 2s 6d

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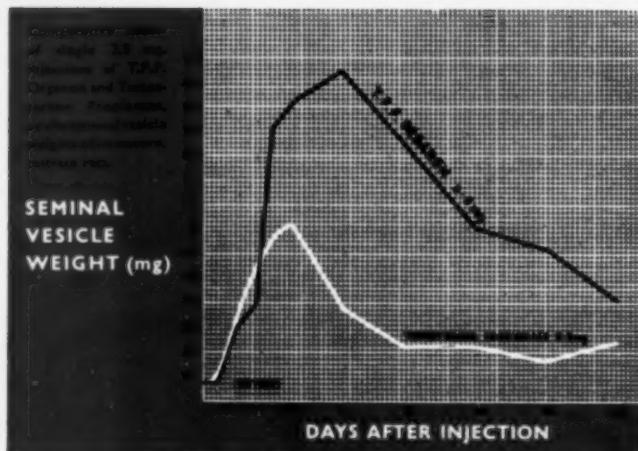
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South African Medical Journal
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 P.O. Box 643, Cape Town Posbus 643, Kaapstad

Vol. 27, No. 18

Cape Town, 2 May 1953

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Vol. 27, No. 18

Cape Town, 2 May 1953

Weekly 2s 6d

HUMAN INFECTION WITH *BILHARZIA BOVIS*

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N. STOFFBERG and BOTHA DE MEILLON, D.Sc., PH.D.

South African Institute for Medical Research and Bilharzia Natural History Unit, Council for Scientific and Industrial Research

The Bilharzia Natural History Unit has for some years studied bilharziasis in the northern watershed of the Witwatersrand. Snail surveys in this area have shown that at certain times as many as 40% of *Physopsis* snails may shed schistosome cercariae from which *B. bovis* has repeatedly been isolated in mice and monkeys. The presence of such a dense focus of *bovis* infection led the unit to undertake a survey of peri-urban European and Bantu school children to determine whether human infection by this parasite could arise.

During this survey the urine of one patient (J.S.) persistently yielded scanty numbers of *bovis* only; no *haematobium* were ever found. Since cases of pure *bovis* infection of the urinary tract have not been reported before, the patient was hospitalized and further investigations undertaken.

CASE REPORT

A European schoolboy (J.S.) aged 13 years lived in the Ferndale area of the northern Witwatersrand watershed for the last three years. Accompanied by his family he visited Hartebeespoort Dam during weekends, indulging in swimming and fishing. In addition he and other school children swam in the local rivers and streams which are known to harbour many *Physopsis* infected with *bovis*. During August 1952, one month before admission to hospital, he noticed mild bouts of terminal haematuria. No other member of his family was similarly afflicted and their urines were negative for ova.

He was found to be of good average physique and there was nothing abnormal in any of the systems of the body apart from the bladder and the presence of *bovis* ova in the urine. Two stool examinations were negative for ova.

Cystoscopy (Sodium Pentothal Anaesthesia). Bilharzial polypi were seen bunched together on the left posterolateral wall of the bladder. They appeared translucent and resembled bulbous oedema. Several characteristic bilharzial tubercles surrounded the polypoid masses and were also seen scattered discretely on the posterior and right lateral walls. Two tubercles were also present on the lateral lip of the right ureteric orifice (Fig. 1a). The intervening vesical mucosa was quite normal. The ureteric orifices were mildly congested but were otherwise normal in appearance and the ureters admitted

size 4 Fr. catheters to the pelvis with ease. The pyeloureterograms were normal. Histological sections of biopsies taken from the polypi and tubercles revealed scanty ova.

TABLE I. RESULTS OF URINE EXAMINATION BEFORE AND AFTER TREATMENT WITH MIRACIL D

Before Treatment.

- 13 August 1952: No ova, erythrocytes present.
- 14 August 1952: One *bovis* ovum.
- 15 August 1952: Several *bovis* ova.
- 27 August 1952: Several *bovis* ova.
- 28 August 1952: Several *bovis* ova. Stool negative.
- 30 August 1952: No ova.
- 2 September 1952: No ova.
- 3 September 1952: Several *bovis* ova. Stool negative.
- 4 September 1952: No ova.
- 5 September 1952: No ova.

After Treatment (Miracil D 5,400 mg. 7 September 1952 to 12 September 1952).

- 16 September 1952: No ova.
- 29 September 1952: No ova.
- 30 September 1952: No ova.
- 24 November 1952: No ova. Bilharzia complement fixation test positive.
- 1 December 1952: No ova.
- 30 December 1952: No ova.

TABLE 2. HAEMATOLOGICAL INVESTIGATIONS

	Before Treatment (29 August 1952)	After Treatment (24 November 1952)
Haemoglobin	15.69 gm. %	16.09 gm. %
Colour index	—	—
Erythrocytes per c.m.m.	5,250,000	5,380,000
Leucocytes per c.m.m.	12,600	5,400
Neutrophils	41.5%	63.5%
Monocytes	5.5%	8.0%
Lymphocytes	29.5%	20.5%
Eosinophils	23.5%	8.0%
Basophils	—	—

TREATMENT

Miracil D (Nilodin—Burroughs Wellcome & Co.) was given orally from 7-12 September 1952, the dosage being

400 mg. thrice daily for 3 days, then 200 mg. thrice daily for 3 days, the total dosage being 5,400 mg. The drug was well tolerated. Following discharge on 13 September he was re-admitted on 29 October for review. He felt very well and had not observed further episodes of haematuria. A repeat blood count revealed that the eosinophilia had decreased from 23.5% to 8% (Table 2). A repeat cystoscopy on 30 October showed 2 to 3 small pin-point

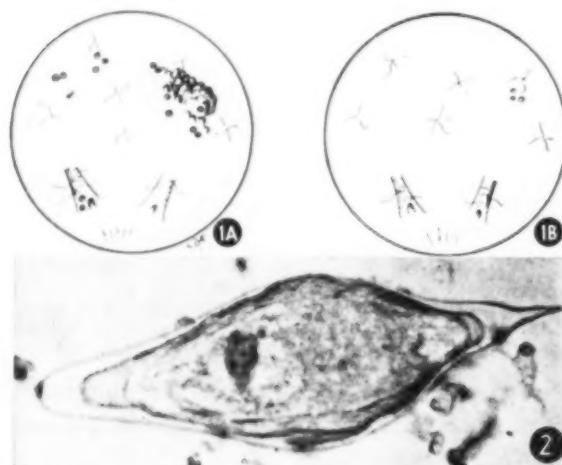


Fig. 1A. Cystoscopic appearances of *S. bovis* infection.
Fig. 1B. After treatment with Miracil D, showing regression of lesions.

Fig. 2. Ovum of *B. bovis* from urine of patient J.S.

tubercles at the site of the pre-existing polypi, the remainder of the vesical mucosa being normal in appearance (Fig. 1b).

THE OVA

The means of 6 eggs (Fig. 2) measured were as follows: length 225 μ , greatest width 78 μ and width at a distance of 50 μ from the blunt end 37 μ . These when used in the formula given by Alves¹⁹ give the following figures for X₁ and X₂, namely 21.6 and 72.5 which agree with his criteria for *bovis* and not for *mattheei*.

EXPERIMENTAL SNAIL INFECTIONS

Physopsis snails were exposed to miracidia from eggs passed by the patient. Cercariae subsequently obtained were passed into mice but most unfortunately only male worms developed.

DISCUSSION

Since the discovery of the parasite by Sonsino in 1876¹ and its observation in a Madras by Christophers and Stevens in 1905² much discussion has taken place whether *bovis* is capable of infecting man. Notable among authors who are in agreement that it may are Cawston,^{3,4,5} Porter,^{6,7} Mahfuz,⁸ Walravens,⁹ Blackie,¹⁰ van den Berghe,^{11,12,13} Alves,¹⁴ van Wezel¹⁵ and Raper.¹⁶ The main site of infection in man may be intestinal or urinary. In all reported cases of urinary infection *bovis* has been found associated with either *haematobium* or

mattheei. McHattie and his colleagues,^{17,18} working in Iraq and recently van Wezel,¹⁵ in South Africa, believe that *mattheei* does not possess sufficiently distinctive features to separate it from *bovis*. Blackie¹⁰ and Alves¹⁴ in Southern Rhodesia, however, consider that *bovis* and *mattheei* are separate species and that man may become infected with either or both. In recognizing the 2 species Alves¹⁹ has declared that there is a 3% chance of wrongly classifying *bovis* as *mattheei* and a 0.5% chance of mistaking *mattheei* for *bovis*.

The interesting features of the case reported here are that it occurred in an area where snails were known to harbour *bovis* in dense concentration and, being a single case, the rarity of human infection is substantiated. It is to be noted that many of the inhabitants of this area live close to heavily infected streams. In many cases these streams supply their only water and children (especially Bantu) may often be seen swimming in them.

Finally this is apparently the first reported case of a pure *bovis* infection of the urinary tract.

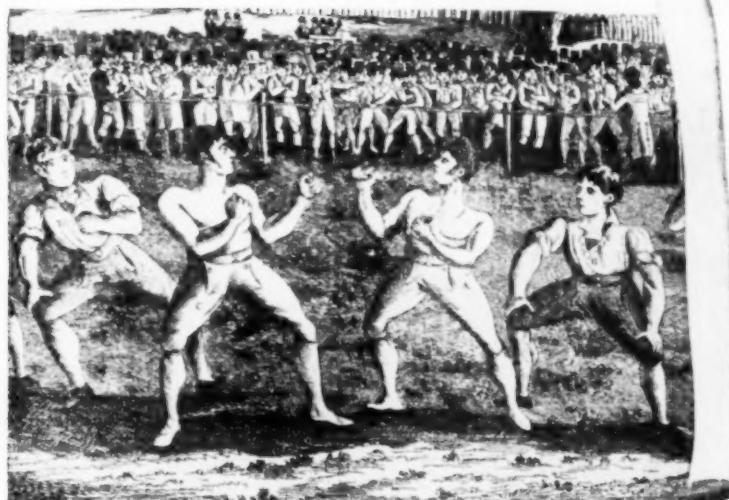
SUMMARY

1. A case of pure *bovis* bilharziasis occurring in the urinary tract of a European schoolboy is reported.
2. The appearance of a single case of this infection in an area where snails are known to be heavily infected with *bovis* confirms the rarity of its incidence in humans.
3. Treatment with Miracil D was successful as evidenced by cystoscopic criteria, negative urine examinations and eosinophil reduction.

We are indebted to Mr. Currie-Brayshaw, Head of the Urological Department, Johannesburg General Hospital, for permission to investigate the case in his department. We wish to thank Miss F. Hardy for technical assistance, Dr. C. Amies for the photograph accompanying this article and the patient and his parents for their willing co-operation.

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South African Medical Journal

Suid-Afrikaanse Tydskrif vir Geneeskunde

VAN DIE REDAKSIE

SIEKTE ONDERSTANDSVERENIGINGS

Op 'n onlangse vergadering van die Federale Raad is 'n nuwe etiese reël van die Vereniging aangeneem wat lede verbied om enige aanstelling, wat nie die Vereniging se goedkeuring wegdra nie, te aanvaar of beklee. Hoewel die reël op alle aanstellings van geneesherre van toepassing is, was dit hoofsaaklik die probleme wat aan Siekte Onderstandsverenigings verbonde is wat die Raad beweeg het om hierdie stappe te doen.

In die belang van die professie en die publiek is dit belangrik dat Siekte Onderstandsverenigings op 'n wyse wat regverdig en billik teenoor die betrokke mediese praktisyne is, en wat voldoende mediese dienste aan hulle lede verseker, geadministreer word. Dit is derhalwe nodig dat die Vereniging 'n wakende oog oor die werkzaamhede van sulke Verenigings hou, en weier om enige een wat se metodes nie aan hierdie standaarde voldoen nie, goed te keur. Sodanige optrede sal nie doeltreffend wees nie, tensy die Vereniging op die ondersteuning van al sy lede kan staatmaak; want sy vernaamste wapen moet die weiering van sy lede wees om aanstellings te beklee by Onderstandsverenigings wat se metodes deur die Vereniging afgekeur word. Die nuwe reël is bestem om dit te verseker.

In Brittanje en elders was die staatsmediese dienste grootliks op die fondamente van die ou vrywillige Onderstandsverenigings gebou wat hul ingeskreve lede van vry mediese dienste voorsien het. Kragtens die eerste Nasionale Assuransie Wet was dit van versekerde persone vereis om by een van die „goedgekeurde Verenigings“ aan te sluit, hoewel die paneel dokters wat die plek van die ou „klubdokters“ ingeneem het, onder Nasionale administrasie en nie onder dié van individuele Verenigings geval het nie, en aan lede was 'n gewysigde vorm van „vrye keuse van dokter“ gegee. Van hierdie begin het die Britse staatsmediese dienste gegroeи.

In Suid-Afrika word die noodsaaklikheid van die voorseeing van genoegsame tuis- en ander mediese dienste aan die hele bevolking, ongeag die vermoë om fooie te betaal, besef; en hoewel ons land, in hierdie opsig tot nou toe by meeste van die Westerse lande agtergebleef het, moet dit verwag word dat die staat in die afsienbare toekoms met 'n nasionale skema sal begin.

Die professie verkiest die metode van die Mediese Hulpverenigings met sy vry keuse van dokter en betaling volgens dienste gelewer bo dié van die Onderstandsverenigings met beperkte keuse of geen keuse nie en betaling volgens salaris. Nogtans, met inagneming van die Britse president en die ekonomiese posisie van 'n groot deel van die Suid-Afrikaanse bevolking, pas dit die Vereniging om

EDITORIAL

SICK BENEFIT SOCIETIES

At the meeting of Federal Council held recently, a new ethical rule of the Association was passed forbidding members to accept or retain any appointment of which the Association does not approve. Although the rule applies to all medical appointments it was chiefly the problems connected with Sick Benefit Societies that moved the Council to take this action.

It is important in the interests of the profession and the public that Sick Benefit Societies should be administered on lines that are fair and equitable to the medical practitioners concerned and that ensure an adequate medical service for their members. It is therefore necessary for the Association to keep the operations of the Societies under observation and to refuse to countenance any whose methods do not conform with these standards. Such action will not be effective unless the Association can rely upon the support of all its members; for its chief weapon must be the refusal of its members to hold appointments in Societies of whose methods the Association disapproves. The new rule is designed to make sure of this.

In Britain and elsewhere the State medical services were largely built on the foundation of the old voluntary Benefit Societies. These had hitherto provided their subscribing members with free medical services. Under the first National Insurance Act insured persons were required to join one of the 'approved Societies', though the panel doctors, who took the place of the old 'club doctors', came under National administration and not that of individual Societies, and members were given a modified form of 'free choice of doctor'. From this beginning has grown the British State medical services.

In South Africa the need is recognized for providing the whole community with adequate domiciliary and other medical services, irrespective of ability to pay fees; and although this country has hitherto lagged behind most of the Western world in this respect, it is to be expected that in the not-far-distant future the State will proceed with a National scheme.

The profession prefers the method of the Medical Aid Societies, with its free choice of doctor and payment according to services rendered, to that of the Benefit Societies, with limited choice or no choice at all and payment by salary. Nevertheless, with the British precedent before it, and considering the economic position of a great part of the South African population, it behoves

met die ontwikkeling van die Onderstandsverenigings van hom te laat hoor. Met die oog nie net op die onmiddelike belang van die publiek en die professie nie, maar ook op die toekomstige moontlikhede van 'n nasionale gemeenskaplike mediese diens, is dit noodsaaklik.

the Association to make itself felt in the development of the Benefit Societies. This is important in view not only of the immediate interests of the public and the profession but also of the future possibilities in the way of a National public medical service.

IDIOPATHIC DILATATION OF THE PULMONARY ARTERY*

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Until recently the clinical diagnosis of idiopathic dilatation of the pulmonary artery remained uncertain. The diagnosis was made at autopsy and authenticated cases were rare. Cardiac catheterization and angiography have led to the recognition of more cases during life, and the diagnosis therefore more firmly established. It is true that the main conditions from which idiopathic dilatation of the pulmonary artery has to be differentiated may be easily recognized in the typical case (patent ductus arteriosus and pulmonary stenosis); difficulties, however, arise if the murmurs and shadows are not typical. As the diagnosis of certain abnormalities carries with it (in contrast to idiopathic dilatation of the pulmonary artery) the practical implication of operation, the diagnosis of idiopathic dilatation of the pulmonary artery is of considerable practical interest.

REVIEW OF LITERATURE

Greene *et al.*¹ reviewed the literature to January 1949 and reported the clinical and haemodynamic findings in 4 of their own cases. They could find only 8 cases in the literature of the last 30 years which were confirmed at autopsy and satisfied the following criteria required for the diagnosis of idiopathic pulmonary dilatation:

1. Simple dilatation of the pulmonary trunk, with or without involvement of the rest of the pulmonary arterial tree;
2. Absence of intra- or extra-cardiac shunts;
3. Absence of chronic cardiac or pulmonary disease, either clinically or at autopsy;
4. Absence of pulmonary arterial disease possibly due to syphilis or more than minimal atheromatous or arteriolar sclerosis.

Of the 8 cases reviewed by Greene *et al.*¹ 6 were females and 2 males, with an age distribution varying from 3 months to 82 years. Cyanosis was present in 3 cases and absent in one. Three had hypoplastic aortas.

As dilatation of the main pulmonary artery is a feature in about 50% of cases of pure pulmonary stenosis, the latter is one of the main conditions from which idiopathic pulmonary dilatation has to be differentiated. Therefore, Greene *et al.*¹ selected 2 groups of 4 cases of each condition and contrasted the clinical and laboratory data. These were their findings:

Three of the 4 cases diagnosed as pulmonary stenosis had a dilatation of the pulmonary artery similar in extent to that seen in the group with idiopathic dilatation.

* Part of this material was used for an M.D. Thesis, submitted to the University of Cape Town, by one of us (M. N.).

All cases of both groups had pulmonary systolic murmurs. All 4 cases of pulmonary stenosis (PS) had a pulmonary systolic thrill, which was also recorded in 2 cases of idiopathic pulmonary dilatation (IPD). In the PS group the second sound was normal in 3, but very faint in one case, while the second sound was described as being louder than the aortic sound in 3 cases and very slightly accentuated in one case of the IPD group. A pulmonary diastolic murmur was heard in only one of the 8 cases, that being a case of IPD.

Greene *et al.*¹ felt that the important difference on clinical examination in their cases, was that in IPD the second pulmonic sound is accentuated, while in PS it is normal or diminished. The authors do not mention whether they noted a splitting in either series of cases.

With catheterization another important difference became apparent: In pulmonary stenosis the right ventricular pressure is high, whereas in idiopathic pulmonary dilatation the pressure is normal. In contrast, Greene *et al.*¹ recorded no difference in the pressure of the pulmonary arteries in both groups, the pressure being lower than that of the right ventricle.

In pulmonary stenosis the presence of the stenosed valves causes hypertension in the right ventricle and a low pressure in the pulmonary artery, whereas in IPD a low pressure in the pulmonary artery is explained by the dissipation of the pressure in the abnormally wide pulmonary arterial tree in the presence of a normal valve.

A slightly lower systolic pressure in the pulmonary artery has also been recorded by Cournand, Baldwin and Himmelstein,¹⁸ whose case (a 6-year-old child) presented with a loud, coarse, systolic, and a loud, blowing decrescendo diastolic murmur best heard in the 2nd and 3rd left interspaces respectively. The electrocardiogram showed a right axis deviation and right bundle branch block. The diagnosis could only be established with certainty by cardiac catheterization, but angiography was not done.

Grishman *et al.*² report 4 cases of idiopathic dilatation of the pulmonary artery on which only angiographic studies were made. In all 4 cases right ventricular or pulmonary hypertension was not suggested from the clinical examination, including the electrocardiogram.

The first case was that of a man 37 years of age, discovered to have a large pulmonary artery on routine X-ray examination. There was a short systolic murmur over the apex and over the pulmonary area. The pulmonary second sound was accentuated.

The second case, a 20-year-old woman, also discovered on

routine radiography, was asymptomatic from the cardiac point of view. There was a short pulmonary systolic murmur and the pulmonary second sound was reported as split.

The third case, a 42-year-old Negress, attended hospital for minor ailments. There was a short pulmonary systolic murmur. The pulmonic second sound was occasionally split and followed by a loud, sharply *decrescendo* and high-pitched musical murmur, which was interpreted by the authors as a Graham-Steele type of murmur.

The fourth case, a healthy European male, 26 years of age, was found to have a short systolic murmur over the apical and pulmonic areas. There was also a short, very faint diastolic murmur, interpreted again as a Graham-Steele murmur.

In all 4 cases the angiocardiograms showed a markedly enlarged pulmonary artery, involving not only the main stem, but the left and right primary branches as well.

Attention has been drawn to a special type of dilatation of the pulmonary artery by Laubry *et al.*³ They presented data concerning 33 patients exhibiting a syndrome very similar to an interatrial septal defect, but who in reality were cases of dilatation of the pulmonary artery associated with a hypoplastic aorta—*grosse pulmonaire-petite aorte*. Laubry³ proved his contention by demonstrating that in 4 of the 5 cases which came to autopsy there was no septal defect. He explained the pathology by a malposition of the septum in the foetal trunx arteriosus.

Gold⁴ would like to restrict the diagnosis of congenital dilatation of the pulmonary artery to cases in which there is a concomitant hypoplasia of the aorta, thus stressing the developmental origin of the condition as

probably due to an unequal division of the trunx arteriosus communis. Greene *et al.*¹ however, do not agree with this restriction, which they regard as too theoretical.

The rarity of the condition is well illustrated by the report of Chapman⁵ and his team. Of 70 cases of suspected congenital heart disease catheterized, only one was diagnosed as dilatation of the pulmonary artery with hypoplastic aorta. This was a European male, aged 43, who complained of dyspnoea for 2 years. A short grade I systolic murmur was heard over the second left interspace. The electrocardiogram showed a deep S1, a diphasic T2 and an inverted T3 wave. P2 was pointed and prominent. The X-ray showed a greatly dilated and pulsating pulmonary conus with dilated main branches. The aortic knob was somewhat hypoplastic. The oxygen content in the right heart and in the pulmonary artery were equal, but no intracardiac pressure readings are reported by the authors. Because of the X-ray findings and the catheterization results, the diagnosis of *grosse pulmonaire-petite aorte* was made, as described by Laubry *et al.*³

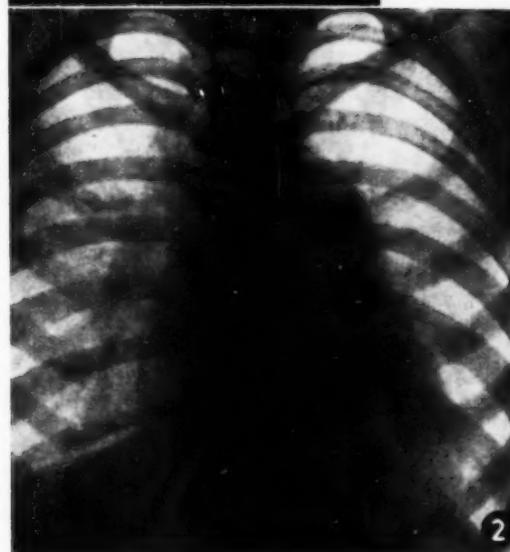
Taussig⁶ mentions a case of idiopathic dilatation of the pulmonary artery, which was so extreme that with the slightest variation in posture the pulmonary artery constricted the trachea and its main branches so as to cause attacks of cyanosis with severe dyspnoea. At autopsy the absence of any other abnormality of the heart or the large vessels could be demonstrated, dilatation of the



Case 1: Fig. 1. Phonocardiogram showing soft systolic and loud diastolic murmur.

Fig. 2. X-ray of heart showing large pulmonary artery and some enlargement of the right ventricle.

Fig. 3. Angiocardiogram: Filling of right side of the heart. Dilated main pulmonary artery. Right and left primary branches well visualized. No filling defect in the pulmonary artery.



pulmonary artery and its main branches being the only abnormal feature.

Soulie, Bouvrain and Joly⁷ have drawn attention to isolated dilatation of a branch of the pulmonary artery, usually the left. No cardiac catheterization or angiographic investigations were carried out in these cases and no post-mortem studies reported. Because in isolated cases of patent ductus arteriosus the left pulmonary artery may be larger than the right due to the direction of the stream of blood from the aorta through the ductus, it is not unreasonable to suspect that at least some of Soulie's⁷ cases may have been examples of patent ductus arteriosus.

Aneurysmal dilatation of the pulmonary artery, i.e. permanent more or less circumscribed dilatation of the pulmonary artery with organic degeneration of its wall shown at autopsy, has been thoroughly reviewed by Deterling and Clagett.⁸ Of 36 cases collected from the literature, 77% were congenital, the remainder being acquired and caused by such conditions as syphilis, mycotic degeneration or atheroma.

CASE REPORTS

Of the 70 consecutive cases of congenital heart disease investigated by angiography and cardiac catheterization for suspected heart disease by our team until 1950, 4 proved to be cases of idiopathic dilatation. Of these,

Cases 1 and 2 could be classified as grade +++, and Cases 4 and 5 as grade ++, according to the classification of Healey, Dow, Sosman and Dexter.¹³

Case 1, M.A. A Coloured female of 8 years was admitted because of epistaxis. The child was energetic and gave no history of fatigue or dyspnoea. There was no cyanosis or clubbing. On routine examination a pulmonary systolic thrill was felt. A soft systolic murmur and a loud diastolic *diminuendo* murmur were heard in the pulmonary area (Fig. 1). The murmur was not continuous and did not suggest the machinery murmur of a patent ductus arteriosus. The pulmonary second sound was not accentuated. Blood pressure, 88/50 mm. Hg. The X-ray (Fig. 2) showed an enlarged pulmonary artery, and some enlargement of the right ventricle. The electrocardiogram was normal.

Cardiac catheterization (Table II) revealed normal mean pressures for both pulmonary arteries and right ventricle, and gave normal oxygen saturations, excluding a possible patent ductus arteriosus or pulmonary stenosis with post-stenotic dilatation.

The clinical and laboratory findings therefore suggested the diagnosis of idiopathic pulmonary dilatation. This was supported by angiography (Fig. 3) which showed a markedly dilated main pulmonary artery. There was no filling defect of the pulmonary artery as described for patent ductus,¹² no refilling of the pulmonary artery from the aorta and no signs of dilatation of the aorta, so typical of patent ductus arteriosus. No signs of any septal defect or pulmonary stenosis were detected either.

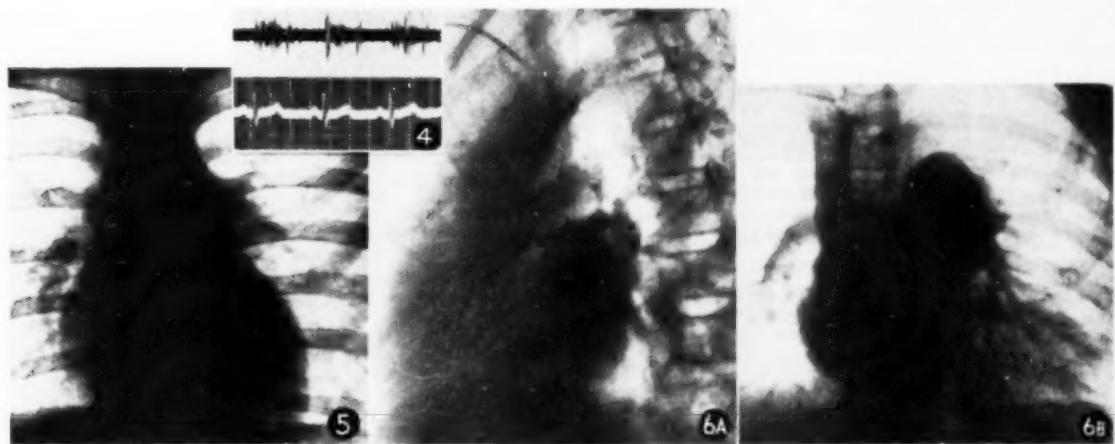
Case 2, N.P. A European girl, aged 12½ years, had no symptoms of any sort; no cyanosis and no clubbing of fingers. Physical and mental development were normal. The heart was not enlarged, except for some dullness in the region of

TABLE I: CHIEF CLINICAL FEATURES OF 14 CASES OF IDIOPATHIC DILATATION OF PULMONARY ARTERY SUBMITTED TO CARDIAC CATHETERIZATION OR ANGIOGRAPHY.

Author	Date	No.	Age	Sex	Cyanosis	Pulmonic Second Sound	Pulmonic Systolic Murmur	Pulmonic Diastolic Murmur	Thrill	ECG
Grishman <i>et al.</i>	1943	1	37	M	—	—	—	—	—	Normal
		2	20	F	—	+ Split	—	—	—	Normal
		3	42	F	—	—	+	+	—	Normal
		4	26	M	—	Occasional split	+	+	—	Normal
Greene <i>et al.</i>	1949	1	17	F	—		+	—	—	Normal
		2	14	F	—		+	—	—	Normal
		3	13	F	—		+	—	—	Normal
		4	6	F	—		+	—	+ Pulmonic systolic	—
Chapman	1949	1	43	M	—	+ Diminuendo	+	Pulmonic systolic	Rt. BBB Rt. axis deviation	Deep S1; Inverted T3; P2 prominent
		—	—	—	—	—	—	—	—	—
Present series	M.A.	1	8	F	—	Soft	+	+	+	Normal
	N.P.	2	12	F	—	Loud split	+	—	Pulmonic systolic	Normal
	V.L.	3	25	F	—	—	+	—	—	Normal
	J.G.	4	23	M	—	Soft	+	—	Pulmonic systolic	R.V. preponderance

TABLE II: PHYSIOLOGICAL OBSERVATIONS IN 15 CASES OF IDIOPATHIC DILATATION OF THE PULMONARY ARTERY
Cases in Same Sequence as Table I.

Author	No.	Oxygen Content Volume %				Pressure (mm. Hg.)			Angiocardiography
		S.V.C.	R.A.	R.V.	P.A.	% Arterial Saturation	R.A. Mean	R.V.	
Grishman et al. ²	1		Not Catheterized						Enlarged pulmonary artery, main stem and right and left primary Branches.
	2		Not Catheterized						Enlarged pulmonary artery, main stem and right and left primary Branches.
	3		Not Catheterized						Enlarged pulmonary artery, main stem and right and left primary Branches.
	4		Not Catheterized						Enlarged pulmonary artery, main stem and right and left primary Branches.
Greene et al. ¹	1	11.7	11.6	11.6	98	3	33/1	14/0	No angiogram.
	2	12.1	13.6	13.4	13.3	99	1	31/6	17/4
	3	13.2	14.5	14.1	14.6	96	2	27/4	20/6
	4	11.7	11.2	11.5	11.5	98	—	22/2	14/4
Chapman ⁵		Oxygen Saturation equal in all chambers				Normal			
Paul Wood ¹²	1	Normal cardiac catheterization findings							
Present series	1: MA.	Oxygen Saturation %				Mean Pressures			
		59	55	59	—	—	15.4	19.0	Enlarged pulmonary artery, main stem, right and left primary branches.
		51.4	58.3	54	56	—	—	8	Dilated pulmonary artery.
		44.4	46	46	44.4	—	2½	10	16
	2: NP.	51.3	52.7	50	50	—	2½	7½	9½
	3: VL.								Enlarged pulmonary artery, main stem, right and left primary branches.
	4: JG.								No angiogram.



Case 2: Fig. 4. Phonocardiogram showing a loud and rough systolic murmur with a splitting of the 2nd sound.

Fig. 5. Straight X-ray of the heart showing enlargement of the pulmonary arteries.

Fig. 6A. Angiocardiogram (L.A.O. picture) showing filling of the left heart and aorta. No re-filling of the pulmonary artery.

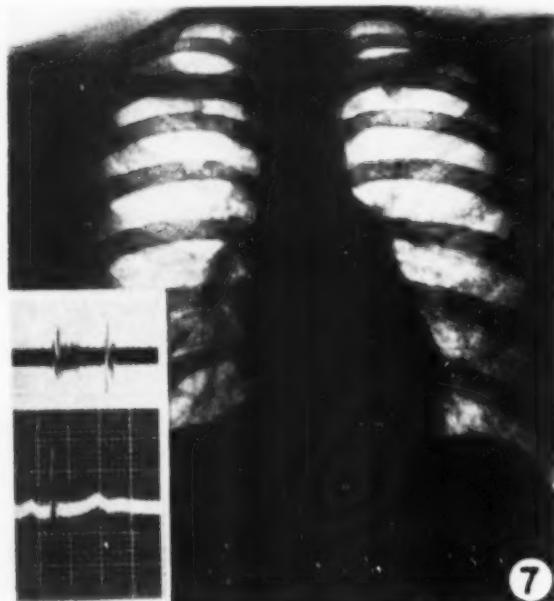
Fig. 6B. Angiocardiogram (A.P. view) showing filling of superior vena cava, right auricle, right ventricle and pulmonary arteries. Markedly dilated main pulmonary artery. No filling defect or pulmonary valve stenosis visualized.

the pulmonary conus. Blood pressure: 110/70 mm. Hg. A well-marked pulmonic systolic thrill and palpable closure of the pulmonic second sound were felt. A loud, rough, pulmonic, systolic murmur was heard, followed by a loud grade 2 split second sound (Fig. 4). The electrocardiogram was normal. On screening: enlargement of the pulmonary arteries, no hilar dance; the aortic knuckle probably a little less prominent than normal. Straight X-rays confirmed these findings (Fig. 5).

Cardiac catheterization (Table II) gave normal values both for mean pressures and oxygen saturation. The findings exclude both a patent ductus arteriosus or pulmonary stenosis.

Angiocardiography confirmed the absence of intra-cardiac shunts and demonstrated a dilated pulmonary artery in the absence of a filling defect, aneurysmal dilatation of the aorta in the oblique, or refilling of the pulmonary artery (Fig. 6a and b).

Case 3. Mrs. V. L. Aged 25 years. As a child the patient was told that she had cardiac murmurs. She has 2 children aged 5 years and 2 months. The blood pressure was 130/80 mm. Hg; no cyanosis or clubbing. There was a harsh systolic murmur over the third costal cartilage (Fig. 7), fairly well localized to this area. The pulmonary second sound was well



Case 3: Fig. 7. Straight X-ray of heart showing dilated pulmonary conus. Phonocardiogram (inset) shows systolic and diastolic murmur with an accentuated 2nd sound.

heard. The electrocardiogram was normal. On screening there was no hilar dance and the pulmonary arterial tree was normal except for dilatation of the pulmonary conus. X-ray of the heart showed no general cardiac enlargement (Fig. 7). The pulmonary conus region is prominent. The aortic knuckle and the aorta were normal in size and situation.

Cardiac catheterization (Table II) gave perfectly normal values for mean pressures and oxygen saturation, excluding both a pulmonary stenosis or a patent ductus arteriosus.

Angiocardiography (Fig. 8a and b) confirmed the absence of shunts and showed the dilated pulmonary artery. No filling defect, refilling, or aneurysmal dilatation of the descending aorta were seen.

Case 4. J.G. A Coloured male, aged 23. The patient was perfectly well until 2 years ago, when he noticed breathlessness on moderate exertion and occasional palpitations. He

also had recurrent joint pains the previous year, but these had never been bad enough to incapacitate him. However, this was his main reason for being admitted to hospital. He had never been examined for cardiac disease and, in fact, had no knowledge of any cardiac abnormality.

There was no clubbing and no cyanosis. Blood pressure 130/90 mm. Hg in both arms. A short, sharp systolic thrill was felt in the pulmonary area. On auscultation a loud systolic murmur was best heard in the third intercostal

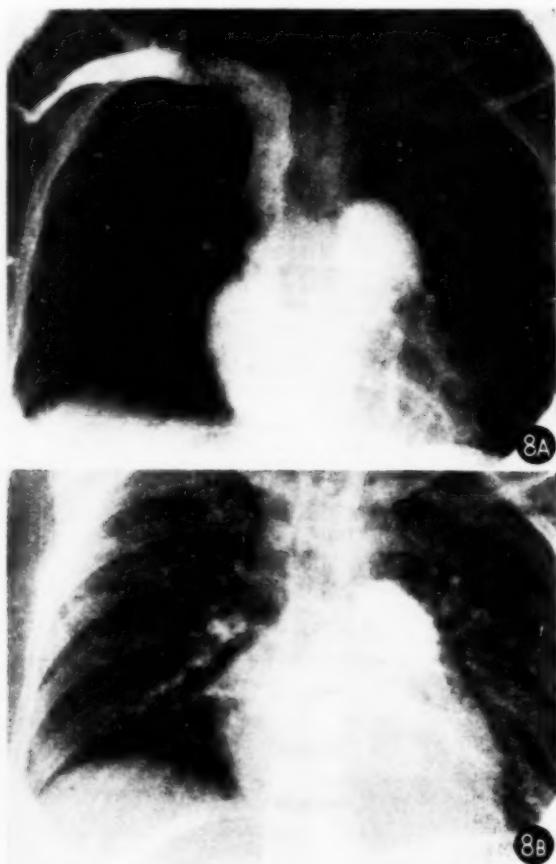


Fig. 8A and B. Angiocardiogram with filling of the dilated pulmonary artery, and right and left primary branches. Absence of intracardiac shunts or valvular stenosis.

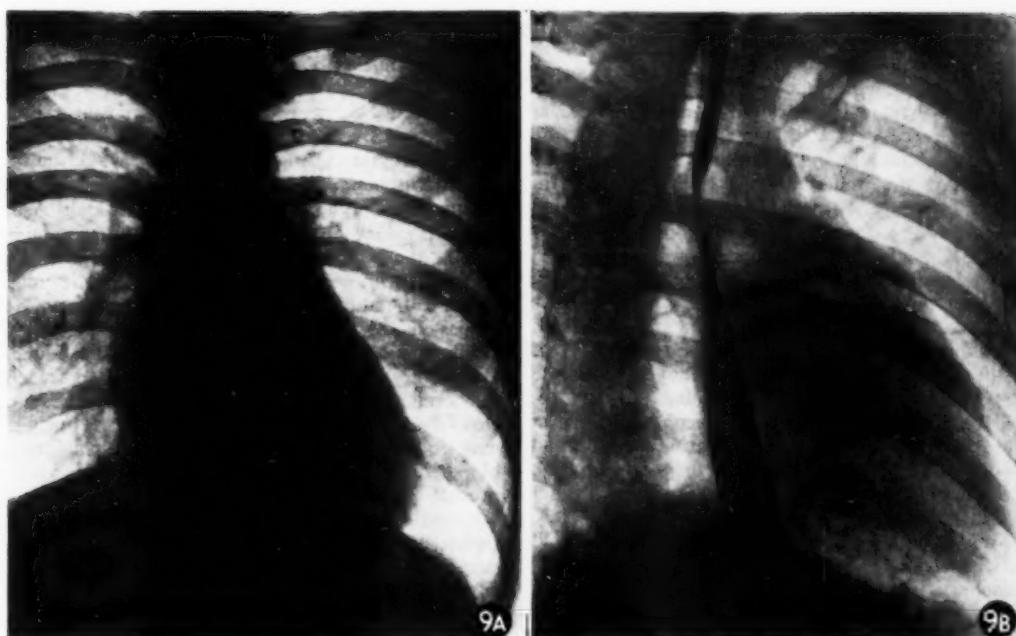
space. There was no conduction of this murmur into the neck, shoulder or axilla. The second sound at the base was soft and single.

X-ray of chest (Figs. 9a and b) showed enlargement of the right ventricle and fullness in the region of the pulmonary conus. On screening the pulmonary artery was dilated, but there was no hilar dance. In the right oblique there was no enlargement of the left auricle, but the fullness in the region of the pulmonary conus was more evident.

Electrocardiography showed a vertical heart with evidence of right ventricular preponderance, and right axis deviation.

Cardiac catheterization (Table II) revealed normal pressures in the right ventricle and pulmonary artery. The oxygen values in the right auricle, right ventricle and pulmonary artery were equal.

Angiocardiography was not performed.



Case 4: Fig. 9A. Straight X-ray reveals fullness in the region of the pulmonary artery and some enlargement of the right ventricle.

Fig. 9B. Oblique X-ray with barium swallow showing absence of left auricular enlargement and presence of fullness in the region of the pulmonary conus.

DISCUSSION

Whenever a case presents with a systolic or diastolic murmur or both in the 2nd or 3rd left interspaces and an X-ray examination reveals enlargement of the pulmonary artery, idiopathic dilatation of the pulmonary artery has to be considered. It may be absolutely impossible to exclude the condition by clinical methods alone, yet the diagnosis is important as the condition does not call for surgical treatment in contrast to some from which it has to be differentiated.

With the use of cardiac catheterization and angiography it has become possible to make the diagnosis of IPD during life with a reasonable amount of certainty. As the name implies, no cardiovascular defects must be present to which the anomaly is secondary. Both investigations together should give sufficient information for the exclusion of shunts and valvular defects.

Dilatation other than idiopathic dilatation of the pulmonary artery may be due to:

- Patent ductus arteriosus;
- Post-stenotic dilatation of the pulmonary artery;
- Atrial and ventricular septal defects;
- Idiopathic pulmonary hypertension with or without pulmonary arteriosclerosis;
- Cor pulmonale due to lung pathology;
- Eisenmenger's syndrome;
- Mitral stenosis;
- Grosse pulmonaire-petite aorte.

These, and the causes of pulmonary artery aneurysms, all need, therefore, to be eliminated before the diagnosis of idiopathic dilatation of the pulmonary artery can be

made. The diagnosis can only be suggested by physical and radiological findings, and a more definite diagnosis made following cardiac catheterization and angiography.

The following considerations will help to differentiate the above conditions:

The diagnosis of the typical case of *patent ductus arteriosus* will not present any difficulty. However, in cases where the typical continuous machinery murmur and the thrill over the pulmonic area are not present, difficulties may arise. Such cases will present no problem on cardiac catheterization, as the oxygen saturation in the pulmonary artery will exceed that of the right auricle and the right ventricle, and suggest a shunt from the left to the right side of the heart. It is necessary to catheterize both the left and the right pulmonary arteries, as the blood may be shunted only to the one (usually the left) side of the pulmonary tree. Angiocardiography rarely shows up the patent ductus itself, but the diagnosis can be made by demonstrating a filling defect in the pulmonary artery in the early pictures¹² and a refilling of the pulmonary artery from the aorta in the late stage.

In differentiating IPD from *post-stenotic dilatation of the pulmonary artery*, Greene *et al.*¹³ put great stress on the normal right ventricular pressure, as opposed to the high readings obtained in pulmonary stenosis associated with low pulmonary artery pressures in both conditions.

In our 4 cases of IPD we confirmed the normal ventricular pressure, but failed to demonstrate the lowered pulmonary pressure, which was normal in all our cases.

This is in agreement with the observation of Wood¹² on 2 cases. However, our pressures, and also Wood's¹³ are mean pressures, while Greene had recordings giving the systolic as well as the diastolic values. Although it has to be admitted that it is the systolic pressures which, according to Greene,¹ show this marked difference, the same difference should be reflected in recordings of the mean pressure, in the well developed case. However, in mild valvular stenosis with closed septa and a dilated pulmonary artery the cardiac catheterization findings may reveal normal mean pulmonary artery pressures and hardly any elevation in the right ventricular pressures. Therefore the differential diagnosis of mild valvular stenosis with a dilated pulmonary artery from IPD is extremely difficult. Angiocardiography may only be of value in the advanced case of stenosis by outlining the ventricular outflow tract and demonstrating the stenosis. Clinically, the findings of a single soft second sound must favour the diagnosis of pulmonary stenosis, and a loud second sound would point towards the diagnosis of IPD, but the differentiation may still be difficult, if not impossible.

Atrial septal defects may also present a difficult differential problem. Dilatation of the pulmonary artery, with pulmonary incompetence and the ECG pattern of right bundle branch block may, in fact, closely resemble this condition. Pulmonary plethora, which is so typical of inter-auricular septal defect and not observed in IPD, is of considerable importance as a differential diagnostic point. Cardiac catheterization may be of help, as it may show a significantly higher oxygen content in the right auricular blood than in the superior vena cava, as the shunt is usually from left to right. Angiocardiography may not prove helpful in the differentiation between the 2 conditions, with the exception that it will clearly outline an enlarged right auricle.

No difficulty should be encountered with the *interventricular septal defect*, as the right ventricular sample will be more oxygenated than the blood in the right auricle in cardiac catheterization studies.

Idiopathic pulmonary hypertension^{9, 10} will be readily recognized by the high pressures in the pulmonary artery on catheterization. However, according to Evans¹⁴ in the late stages of IPD pulmonary hypertension may develop when the 2 conditions may be identical in every respect.

Cor pulmonale due to lung pathology should not be difficult to diagnose.¹¹ The lung disease should be manifest and cardiac catheterization will reveal high pulmonary arterial pressures.¹¹

In *Eisenmenger's syndrome* the differential diagnosis will come mainly from the angiocardiogram. This will reveal the over-riding aorta and simultaneous filling of the aorta and the pulmonary artery will be shown. Cardiac catheterization will reveal some pulmonary hypertension as well, differentiating the condition from Fallot's tetralogy.

Although the differential diagnosis of *mitral stenosis* in the typical case should present no difficulty on the clinical features alone, the large left auricle may be demonstrated by angiocardiography, and pulmonary hypertension will be recorded in the well-established case.

It is difficult, in regard to *grosse pulmonaire-petite aorte*, to know precisely when the aorta is smaller than normal. In Case 2 we thought that the aortic knuckle was probably less prominent than usual—but in none of our cases did we feel justified in diagnosing the condition as described by Laubry *et al.*³ from the straight X-ray or angiocardiogram. Angiocardiography would be of help in this condition in definitely delineating a small aorta, and so confirm the impression given by a straight X-ray.

The presence of the pulmonic systolic murmur in dilatation of the pulmonary artery has led to much discussion. A mechanism responsible for this systolic murmur in simple dilatation of the pulmonary artery has been suggested by Chisholm.¹⁵ He says that when the pulmonary artery orifice enlarges with the dilatation, the tissues most resistant to stretching are the free edges of the semilunar cusps. These free edges, instead of being closely applied against the arterial wall during systole, may form 3 cords across the orifice, thus impeding the blood flow and causing a systolic murmur. He calls this process 'trigonoidation'. He does not invoke this mechanism to explain pulmonary diastolic murmurs in simple dilatation, but to us it appears not unreasonable to suggest that the same mechanism applies, in that the free edges of the cusps due to ring dilatation, do not approximate adequately, thus allowing regurgitation of the blood.

Gold⁴ advances the theory that stress in a dilated pulmonary artery is greater than in a vessel of normal calibre. Thus when there is a column of fluid at constant pressure in a cylinder, the stress at any point on the vessel wall is directly proportional to the diameter of the cylinder at that point, and if increased stress on the vessel wall leads to arteriosclerosis, the sclerotic changes would readily appear in the dilated vessel, leading to narrowing of the lumen and ultimately pulmonary hypertension.

Evans¹⁴ described pulmonary hypertension in cases of congenital dilatation of the pulmonary artery. He says that the essential lesion is a congenital hypoplasia or aplasia of the media of the smaller pulmonary radicles and that endarteritis fibrosa develops at these sites. Though he argued that the pathological change is always the primary cause of pulmonary hypertension, analogy with the histological findings in systemic hypertension suggests that it may in fact represent the end result.¹⁷

Whatever the mechanism, the eventual course of some cases of idiopathic dilatation of the pulmonary artery appears to be the onset of pulmonary hypertension and pulmonary arteriosclerosis with cyanosis and right heart stress.

SUMMARY

1. Four cases of idiopathic dilatation of the pulmonary artery are described.
2. The differential diagnosis is discussed with special reference to congenital cardiac anomalies amenable to surgical treatment.
3. Previously reported cases are quoted.
4. The importance of cardiac catheterization and angiocardiography in the diagnosis of these cases is stressed.
5. The difficulty or impossibility of differentiating mild pulmonary valve stenosis from idiopathic pulmonary dilata-

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tation even with the aid of these special investigations is emphasized.

We are most grateful to our colleagues in the Department of Medicine, Prof. F. Forman, Prof. F. Brock, Dr. I. Mirvish and Dr. A. M. Moll for referring the cases used in these studies. Our thanks are due to Mr. Goosen and Miss E. Scholtz for help in the oxygen studies. We express our thanks also to the staff of the X-ray Department, who have been most helpful and co-operative.

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PATENT DUCTUS ARTERIOSUS

A REVIEW BASED ON 24 CASES*

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This paper presents a brief review of the classical pathological, clinical, diagnostic and operative features of the patent ductus based on the records of 24 personal cases operated upon since October 1949.

Historical. The possibility of surgical closure of the patent ductus was first envisaged by Munro in 1907 and the first ligation was unsuccessfully attempted by Strieder in 1938. In 1939 Gross reported the first successful case and since that time a most voluminous literature has grown around this relatively common cardiac anomaly, articles emanating from surgical centres all over the world. As far as can be traced there has been no series of cases reported upon as yet in the South African medical literature.

ATOLOGY

Heredity plays no established role.

Sex Incidence. The reported cases show marked preponderance of females. Gross¹ states that 70% of his 525 cases were females. We have only had 5 males in our 24 cases.

Age. The ductus is patent during intra-uterine life, thus enabling venous blood entering the heart through the venae cavae to short-circuit the atelectatic lungs and pass directly to the aorta and thence to the placenta. Obviously, then, all children have at birth a patent ductus which, in most cases, closes within 5 minutes of birth. It is the lack of this normal physiological occlusion which leads to persistent patency of the ductus. Closure of the ductus is probably due to several factors, viz.:

1. A vagal reflex stimulating constriction of smooth muscle fibres in its wall.

- Chemical stimulation to contract when the blood flow alters.
- Kinking of the ductus from expansion of the lungs.
- Degenerative obliterative changes in its wall.

Nevertheless, it is rare for a ductus to be diagnosed in infancy, although in our third case a typical machinery murmur was recorded at the age of 6 weeks, and in 5 others it was heard under the age of 2 years. This is because in early infancy the aortic pressure is low and the pulmonary artery pressure relatively high, so that there is little blood flow through the ductus and no murmur is heard. As the aortic pressure rises, a systolic murmur becomes evident. Later, when the difference between the pressures in the 2 circulations increases still further, the typical murmur becomes evident. In our 19th case the diagnosis of a patent ductus was made clinically for the first time at the age of 29 years, when she was examined by a physician, despite 2 previous surgical admissions.

Incidence. It is said to occur in 1 : 6,000 adults.

PATHOLOGY

The ductus is stated to vary from 0.5 to 0.7 cm. in diameter, with an average length of 0.7-1 cm. In our first case the ductus was almost 2 cm. long. It passes from the first part of the pulmonary artery to the distal portion of the aortic arch, which it joins at a point just below the origin of the left subclavian artery. The ductus may be cylindrical or funnel shaped; in the latter case the wide end of the funnel is at the aortic end. In most of the older patients the ductus has presented, after dissection, as a short structure, rather like a fistula between the pulmonary artery and aorta, which lie in very close approximation. In Case 4 the circumference of the ductus was

* A paper read at the South African Medical Congress, Johannesburg, September 1952.

about 4", and despite ligation with tape the flow could not be obliterated completely at the time of operation. This girl, aged 19 years, had gross pulmonary hypertension with a pulmonary artery pressure of 90/70 mm. Hg, with a partially reversed flow. Before operation she had only a systolic murmur over the pulmonary artery with an early diastolic murmur indicative of pulmonary incompetence. After operation a typical Gibson murmur could be heard for the first time. This case of Professor Elliott's is being published elsewhere by Dr. Bothwell.²

The persistence of this arterio-venous shunt may be tolerated extremely well if the shunt is small and infection does not supervene. Usually, however, one or other of the following pathological complications ensues:

- As much as 50% of the left ventricular output may leak through the ductus into the pulmonary artery, producing a deficient peripheral circulation. This may result in physical retardation, which occurred in 8 of our patients.

- The heart may increase its output to overcome the deficient peripheral circulation with resultant left ventricular failure. Ten of our patients were breathless on exertion.

- Pulmonary hypertension with right ventricular hypertrophy and failure may result from the increased blood flow. Three of our cases had marked pulmonary hypertension. (One was a child of 10 years, Case 23.) If the pulmonary hypertension becomes extreme, the shunt is reversed and blood will flow from the pulmonary artery to the aorta with resultant cyanosis. Case 4 fell into this latter category.

- Bacterial infection (usually due to a *Streptococcus viridans*) can occur and is stated to affect 25% of those who survive into adult life, and is most common in the third and fourth decades.¹ We have no cases of subacute infective endocarditis in the present series, but Case 2 had a prolonged pyrexia with a negative blood culture which dropped rapidly after ligation.*

- The complication of aneurysmal dilatation in early life and rupture as an adult is very rare.

PROGNOSIS

As in many other conditions the medical and surgical prognosis is at variance. Nevertheless, it is a fact within our own experience that the lesion is quite common amongst children and at a Children's Hospital but relatively rare amongst adults and at the General Hospital. We have had 17 cases under the age of 15 years, 6 between the ages of 15 years and 30 years, and one aged 38 years. Gross¹ reports operating upon a woman of 51 years. The fact that 2 cases survived to the age of 73 and 75 years, and merit report by Fishman and Silverthorn,³ merely emphasizes the rarity of such survival. It can be accepted that this is usually a benign condition in early life. It has been estimated that those who do survive until the age of 17 years have their life expectancy halved. Of those ductuses diagnosed at the age of 3 years, 14% died from their heart lesion by the age of 14 years, 50% by 30 years and 71% by the age of 40 years. Of the deaths, 42% were from infection (before the introduction of antibiotics) and 28% from congestive heart failure. Infection can to-day be controlled by antibiotics, but surgical closure is necessary for cure.

The prognosis, however, should not be assessed only from the aspect of longevity, but also rather from the point of view that the quality of the patients' lives is often dramatically improved by operation.

* We have had 3 cases of infection in a subsequent 6 cases operated on by my associate Mr. D. Fuller and myself.

DIAGNOSIS

The diagnosis is based upon the symptoms, physical signs (see Table 1), radiological examination and certain special investigations which are discussed below. It cannot be emphasized too strongly, however, that in almost all cases the diagnosis can be made on the presence of the classical murmur. In all but one of our cases the murmur was typical. Case 4 had a systolic murmur along the left sternal border with an early pulmonary diastolic murmur of pulmonary incompetence. This patient had gross pulmonary artery hypertension on cardiac catheterization, with a partially reversed shunt, referred to above and published elsewhere by Bothwell.²

SYMPTOMS

- These are few in childhood, when the patient may appear normal. In some there may be slight limitation of physical activity or they may tire readily. Twelve of our cases gave this story.

- Breathlessness on exertion is also rare in childhood but is almost invariably present in the adults. Of 6 of our patients over the age of 20 years, 5 complained of dyspnoea on exertion. Fourteen of the total number complained of this symptom. Case 12 typifies the asymptomatic nature of the lesion in childhood and its inevitable progression in adult life. This patient played rugby at school, could swim underwater for considerable distances, and stated that he had more stamina than the average young man. In 1945 and 1947 he was passed A1 for insurance. In 1948 at the age of 21 years he noticed for the first time in his life that he was becoming short of breath on exertion. He continued with his sport, but in 1949 found that the breathlessness had become so severe that he gave up all forms of sport. By 1950 he found that walking half-a-mile to his work resulted in dyspnoea and it was because of this that he was examined and a patent ductus diagnosed. A year after operation he experienced no dyspnoea on moderate exertion.

- In adults the symptoms of cardiac failure may supervene or pulmonary hypertension may ensue. Three of the cases had gross pulmonary hypertension as shown by cardiac catheterization (case numbers 4, 22, and 23).

- Ten of the cases were below par in their general development and capacity.

- The symptoms of bacterial endocarditis will result from infection. There will be the general symptoms of pyrexia as well as the pulmonary symptoms from pulmonary infarction. We have had no cases of endocarditis.

- Case number 10 had occasional fainting attacks and if this is associated with cyanosis when the child cries it is due to a reversal of the shunt from the temporary increased pulmonary artery pressure exceeding the mean aortic pressure. Fainting is also said to occur when the diastolic pressure drops on exercise.

PHYSICAL SIGNS

- Stunting of growth occurs when the shunt is large. Seven cases in this series showed fairly marked retardation of physical growth—the most extreme being Case 24 who, at the age of 18 years, weighed 75 lb. and whose height

TABLE I: PATIENT DUCUS

Case No.	Name	Age	Sex	Tired	Breathless	Below Par	Stunted	Murmur	Thrill	Blood Pressure (mm. Hg.)	E.C.G.	L.V. on on X-Ray	L.A. on on X-Ray	Hilar Dance	P.A.
1	S.C.	10	F	+	—	0	0	T	Continuous	140/70	L.V.P.	0	0	+	+
2	R.D.	8	M	—	—	—	—	T	Systolic	118/70	N.A.D.	+	—	+	+
3	D.G.	5	F	0	—	—	+	T	Systolic	100/50	L.V.	—	—	+	—
4	H.G.	19	F	—	+	—	—	Systolic Pulmonary Incompetence	Systolic	120/50	Combined V.P.	+	+	—	+++
5	M.H.	4	F	—	—	—	+	T. & A.D.	Carotid	140/50	L.V.P.	0	0	0	0
6	E.K.	23	F	—	—	—	—	T.	0	N.R.	N.A.D.	+	0	—	+
7	P.K.	7	F	+	—	+	—	T.	Systolic	130/60	N.A.D.	+	0	+	+
8	M.M.	10	F	—	—	—	—	T.	0	125/70	N.A.D.	N.A.D.	—	—	+
9	J.P.	5	F	0	—	0	0	T. & A.D.	Continuous	146/90	N.A.D.	+	—	+	—
10	P.R.	9	F	—	—	—	0	T. & A.D.	0	110/60	L.V.P.	+	+	+	—
11	P.R.	19	F	—	Slight	—	0	T. & A.D.	Systolic	120/74	N.A.D.	+	0	+	+
12	J.S.	23	M	+	—	—	—	T.	0	125/70	0	+	+	+	+
13	A.S.	7	F	+	—	—	—	T.	Continuous	135/50	L.V.	Rt.V. +	0	+	+
14	G.T.	5	M	—	—	—	—	T.	Diastolic	108/58	R.V.	++	0	+	—
15	H.D.	6	M	+	—	—	—	T.	—	125/70	N.A.D.	N.A.D.	N.A.D.	+	—
16	B.V.	30	F	++	—	—	—	Aortic stenosis T. & A.D.	Systolic	118/86	L.V.P.	Rt.V. +	—	0	0
17	S.W.	9	F	0	—	—	—	T. & A.D.	0	120/80	N.A.D.	+	+	+	—
18	J.C.	8	F	—	—	—	—	T.	Continuous	90/45	N.A.D.	0	0	0	0
19	T.A.	29	F	+	—	—	—	T.	—	160/86	N.A.D.	N.A.D.	+	+	—
20	H.	3	F	+	—	—	—	T. & A.D.	Systolic	110/70	L.V.P.	+	—	—	+
21	J.C.	9	F	0	0	0	0	T.	Continuous	114/70	0	0	0	0	0
22	C.T.	38	F	+	—	—	—	T. & Pulm. I.	0	130/50	Combined V.P.	—	++	+	++
23	D.F.	10	M	—	—	—	—	T. & A.D.	—	100/45	—	R.V. +	—	—	—
24	W.	18	F	—	—	—	—	T. & A.D.	Systolic & Diastolic	125/40	—	+ & R.V.	—	+	+

F = Female.
M = Male.
+ = Present.
— = Absent.
0 = No record.
A.D. = Apical diastolic murmur.
Pulm. I. = Pulmonary Incompetent murmur.
L.V.P. = Left ventricular preponderance.
Combined V.P. = Combined Ventricular Preponderance.
Rt.V. = Right ventricle enlarged on X-Ray.
T = Typical machinery murmur.

was 4' 8 $\frac{1}{2}$ ". Despite this she fell pregnant and had her ductus ligated during the fifth month of her pregnancy.

2. Colour is usually good in uncomplicated cases, though a third of the cases showed pallor with anaemia on blood examination. None of our cases showed cyanosis despite gross pulmonary hypertension in 3.

3. The heart size is stated to be usually normal on clinical examination, but 8 of ours showed the apex beat to be displaced outside the nipple line.

4. The cardiac impulse was forceful in all cases.

5. In several, visible pulsation was seen over the left second interspace due to the dilated pulmonary artery.

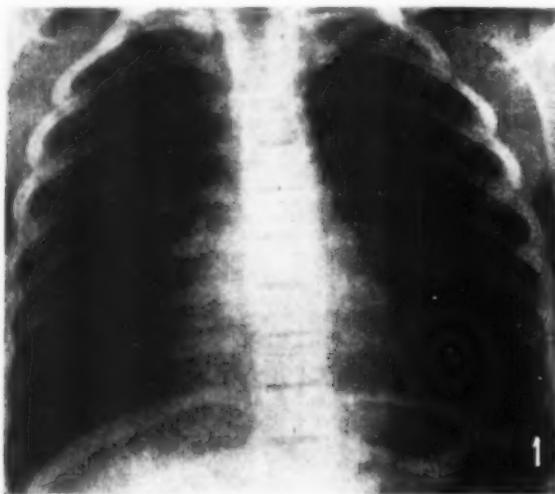


Fig. 1 (Case 15): A normal X-ray in a typical ductus, aged 6 years.

6. The presence of a thrill over the pulmonary area is reported in 50% of cases. In the present series 5 cases had a continuous thrill, 7 a systolic, 1 a diastolic and 1 a systolic and diastolic thrill. In 1 case the thrill was felt only in the carotid, 4 cases had no thrill at all and in 5 cases the case histories are incomplete.

7. *The Murmur.* This is the most important physical sign, to which the name of Gibson has been attached. Typically it is described as being a machinery or 'train-in-the-tunnel' murmur, which classically is continuous throughout systole and diastole, accentuated during the former and diminishing during the latter and heard best over the left second and third interspaces. The systolic element is often transmitted up into the neck and can be heard in the back. The typical murmur is often best heard below the middle third of the left clavicle. It is usually harsh and rumbling in character but in Case 19 was so soft that despite 2 surgical admissions the murmur was never heard. The murmur was also quiet in Case 12, passed fit by 2 different doctors for insurance. Twenty-two of our cases presented with a typical murmur.

Case 23 with pulmonary hypertension had, in addition to the typical murmur, the early diastolic murmur of pulmonary incompetence—the latter persisting after operation.

In Case 4, also with gross pulmonary hypertension, the Gibson murmur was absent and she presented with a systolic murmur along the left sternal border together with the murmur of pulmonary incompetence.

8. Apical mid-diastolic murmurs occurred in 10 of our 24 patients. These murmurs are probably of functional origin, due to a change in cardiac haemodynamics, as they all disappeared after ligation.

9. The blood pressure characteristically shows a very high pulse pressure. This has been present in all our cases, the highest level being 145/50, the lowest 90/45



Fig. 2 (Case 3): X-ray showing a broad squat heart with left ventricular enlargement in a girl of five. LV=Left ventricle.

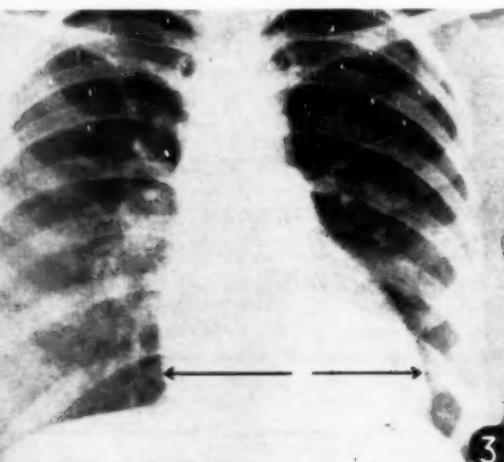


Fig. 3 (Case 24): X-ray showing evidence of marked left ventricular enlargement in a pregnant woman of 18 years. LV=Left ventricle; RV=Right ventricle.

mm. Hg. In 15 cases a collapsing pulse was recorded, but it cannot be said to have been absent in the remaining 9, as no comment was made in the records.

10. The ECG is usually stated to be normal, except in the presence of cardiac failure. This has not been our experience. In only 10 cases has the ECG been normal. In 8 there have been signs of left ventricular preponderance. Gross¹ states that right ventricular preponder-

ance should make one hesitate to accept the diagnosis of a patent ductus. In Case 14, however, all the typical features of a ductus were present in a boy of 5 years, and yet the ECG showed right ventricular preponderance.

No cyanosis followed ligation of this boy's ductus.

In 2 adults with pulmonary hypertension (Cases 4 and 22) the ECG showed combined ventricular preponderance.

11. *X-ray Examination.* This is said to be *normal* in

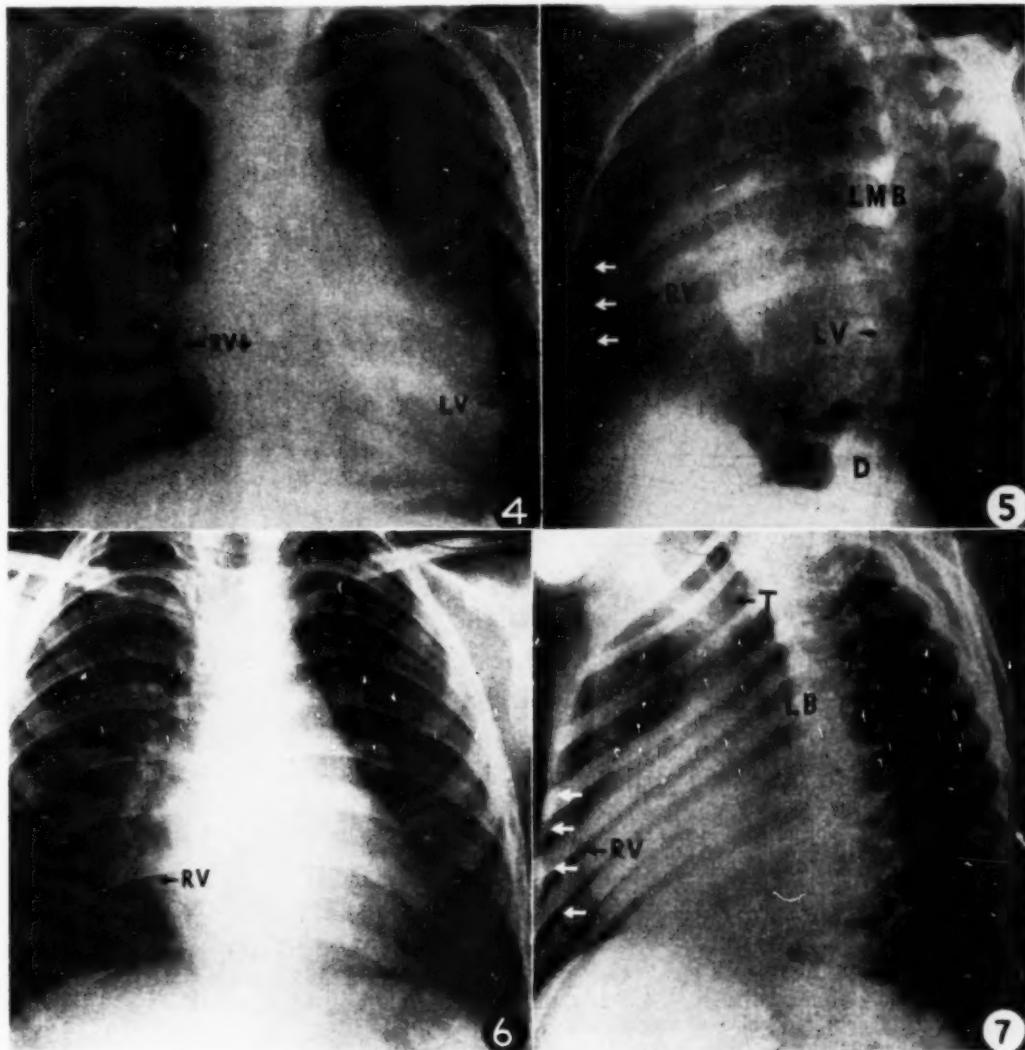


Fig. 4 (Case 13): X-ray showing a prominent pulmonary artery with right ventricular enlargement in a girl of 7 years.

Fig. 5 (Case 13): X-ray with marked evidence of right ventricular hypertrophy on an oblique X-ray. The left ventricle is displaced backwards. T = Trachea; LMB = Left main bronchus; LV = Left ventricle; RV = Right ventricle; D = Diaphragm.

Fig. 6 (Case 23): X-ray with right ventricular enlargement in a boy of 10 who had gross pulmonary hypertension on catheterization. The pulmonary artery segment is normal. RPA = Right pulmonary artery; RV = Right ventricle.

Fig. 7 (Case 23): An oblique film to demonstrate the gross right ventricular enlargement. T = Trachea; LB = Left bronchus; RV = Right ventricle.

most cases when the ductus is small, but only 2 of our cases were absolutely normal on radiology (Fig. 1).

Because of the increased left ventricular output the *left ventricle* showed enlargement in 50% of our cases (Figs. 2, 3, 17, 18). In 3 both ventricles appeared to be enlarged. In 2, the right ventricle only was hypertrophied (Figs. 5, 6). In Case 13 (a girl of 7 years) this was so marked that

be demonstrated on the X-rays (Figs. 11-14) it is often best seen on screening. This was present in 16 cases and in 3 the enlargement of the pulmonary artery was extreme (Cases 24, 22 and 4; in the latter the pulmonary artery filled the retrosternal space in the oblique film). The increased pulmonary flow was evident in 11 cases in which pulmonary vessel pulsations were increased.

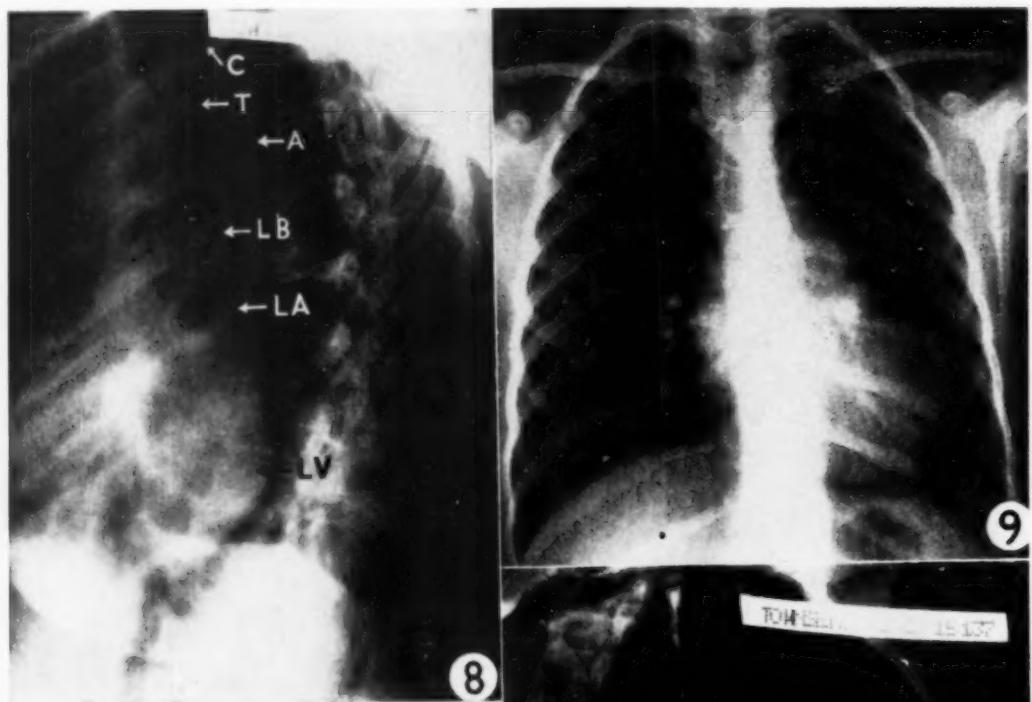


Fig. 8 (Case 22): An oblique film showing not only marked enlargement of the left ventricle but also of the left auricle, which is enlarged upwards to the left main bronchus. C—Clavicle; T—Trachea; A—Aorta; LB—Left bronchus; LA—Left auricle; LV—Left ventricle.

Fig. 9 (Case 25—not included in this series): The enlarged left auricle is well seen on this penetrating film of a child who had subacute bacterial endocarditis in a patent ductus.

Fig. 10 (Case 22): The barium swallow shows the typical indentation by the enlarged left auricle.

the sternum was unduly prominent (Figs. 4, 5). In Case 16 the right ventricle appeared enlarged despite a concomitant rheumatic aortic stenosis. In 4 there was no abnormality and in 3 cases the X-rays cannot be traced.

Because of the increased pulmonary flow, the *left auricle* enlarges as shown by posterior displacement of the barium filled oesophagus (Figs. 8, 9 and 10). This was present in 8 of our cases. In addition in Case 12 a double density was seen on the right. In 12 cases the left auricle was normal and in 4 no records are available.

Prominence of the Pulmonary Artery. Although this can

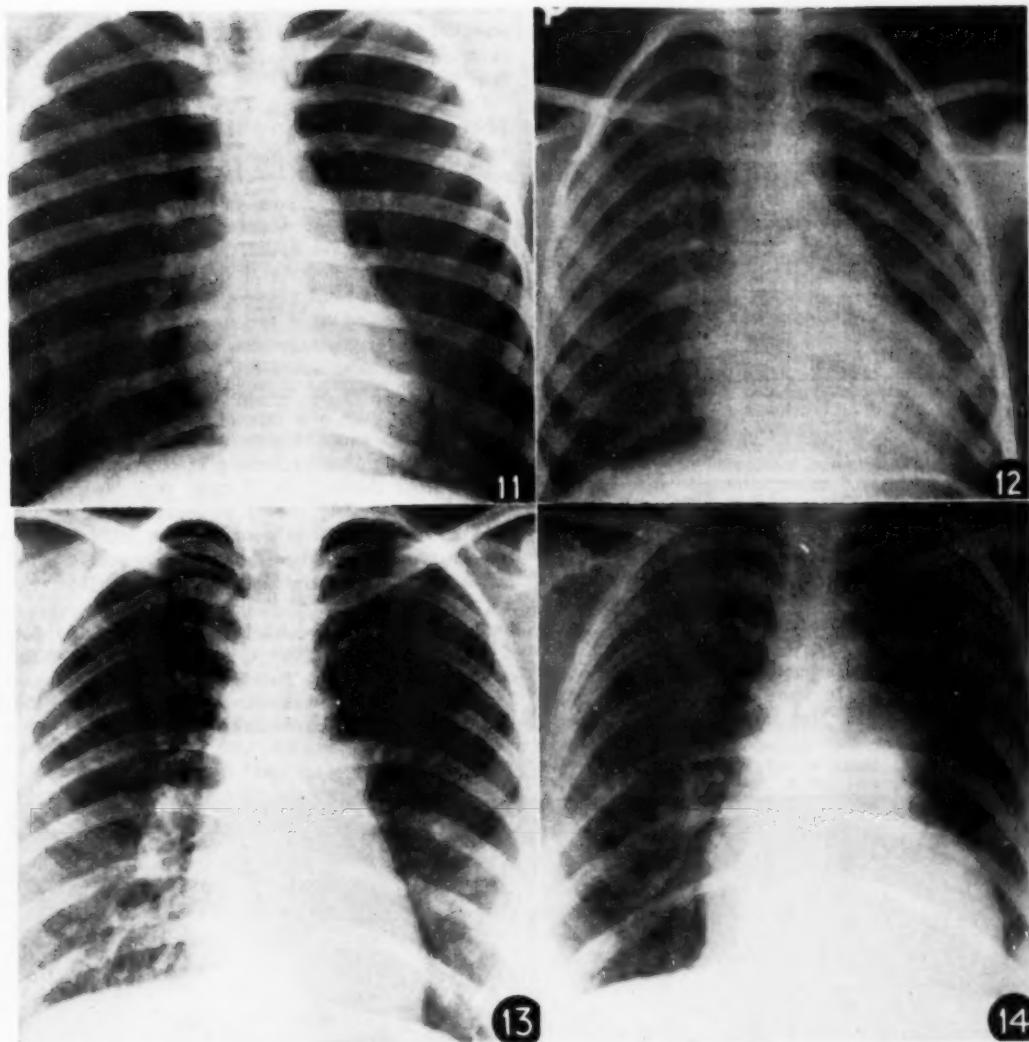


Fig. 11 (Case 8): The X-ray shows a prominent pulmonary artery with normal pulmonary vascular markings.
Fig. 12 (Case 11): The X-ray shows a prominent pulmonary artery segment with slight increase in the vascular markings.

Fig. 13 (Case 19): The X-ray shows prominent pulmonary artery segment with marked increase in vascular markings.
Fig. 14 (Case 22): This X-ray of a woman of 38 with gross pulmonary artery hypertension shows a very large pulmonary artery on the P.A. film.

SPECIAL INVESTIGATIONS

(a) *Cardiac Catheterization.* This has been used in only 8 of our cases and is not deemed necessary where the diagnosis is established on clinical grounds. It is used to exclude some other concomitant heart lesion, or where doubt has been cast on diagnosis of the patent ductus (e.g. in Case 16, where the right ventricle was enlarged on X-ray) or to confirm the presence of pulmonary hypertension, secondary to a ductus.

In Case 4 the findings were (Table 2):

TABLE 2

Site	Pressure mm. Hg	O ₂ Content Vols %	O ₂ Saturation %
Left pulmonary artery	90/70	15.45	87.6
High right ventricle	90/5	14.43	81.9
High right auricle	9/3	11.86	67.3
Arterial saturation		Oximeter reading	93

The findings in Table I confirmed the presence of a marked systolic and diastolic hypertension from the pulmonary artery—the former being 3 times the normal upper limit, and the latter 6 times the normal pressure.

The oxygen content of the pulmonary artery had a significantly higher oxygen content than that in the right ventricle.

In Case 23, a boy aged 10 years, X-rays showed right ventricular hypertrophy; pulmonary hypertension was suspected and confirmed by catheterization. The results are shown in Table 3:

TABLE 3

Site	Pressures (in mm. Hg)		% Saturation (Oximeter)
	Systolic	Diastolic	
Ductus or aorta	102	70	90
Mid-right ventricle	102	5	72
Right pulmonary artery	100	60	78
Mid-right auricle	—	2	71

Dr. M. McGregor (to whom I am indebted for this catheterization) remarked: 'There is marked hypertension in the right ventricle and pulmonary artery with evidence of arterialization of pulmonary artery samples consistent with a ductus flow of approximately 44% of aortic flow. It is of interest that, on withdrawing the catheter from the aorta to the pulmonary artery, no recordable pressure difference was observed. In spite of this, left to right (aorta to pulmonary) flow was considerable and there

was no evidence of any reversing of flow at rest.' It seems likely that this child would have developed a reversed shunt, viz. from pulmonary artery to aorta in later life with cyanosis.

(b) *Angiocardiography*. This has only been used in Case 22 (Fig. 15), a woman of 38 years with gross pulmonary hypertension and pulmonary incompetence where a reversed shunt was suspected. This was not confirmed. In our opinion it plays no role in the routine of establishing the diagnosis of a patent ductus, except where the diagnosis is in grave doubt.

(c) *Phonocardiography*. This has been performed in all our cases and I must acknowledge our debt to Dr. Greenstein for assisting us in this matter. In all cases the clinical estimate of the murmurs has been confirmed and has been of particular value for record purposes in showing the disappearance of the Gibson and of the apical mid-diastolic murmurs, after operation.

(d) *Thoracoscopy*. We have not been impressed by the value of this minor procedure in confirming the presence of a patent ductus. In 5 cases thoracoscopy was performed immediately before thoracotomy in proven cases of patent ductus, but in none was the ductus seen through the thoracoscope. When the chest had been opened, independent witnesses were unable to confirm the presence of the ductus merely by inspection. That this is so can readily be appreciated whilst operating on the ductus, as it is almost invariably deep in the mediastinum and covered by lymphatic glands. In the youngest case aged 2 years 9 months the thymus passed well on to the aorta, and completely obscured the ductus (Fig. 16).

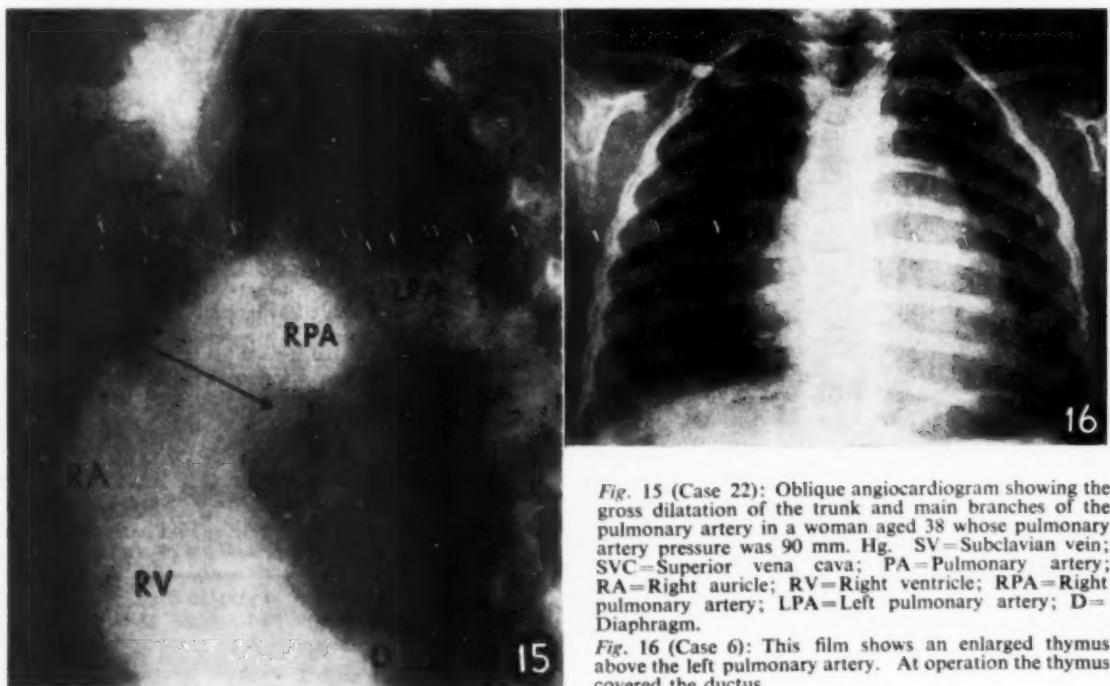


Fig. 15 (Case 22): Oblique angiogram showing the gross dilatation of the trunk and main branches of the pulmonary artery in a woman aged 38 whose pulmonary artery pressure was 90 mm. Hg. SV=Subclavian vein; SVC=Superior vena cava; PA=Pulmonary artery; RA=Right auricle; RV=Right ventricle; RPA=Right pulmonary artery; LPA=Left pulmonary artery; D=Diaphragm.

Fig. 16 (Case 6): This film shows an enlarged thymus above the left pulmonary artery. At operation the thymus covered the ductus.

DIFFERENTIAL DIAGNOSIS

As has already been stated, the diagnosis can be made with certainty on the presence of the classical Gibson murmur. There are, however, several lesions which can cause a continuous murmur, viz:

i. *Rupture of an aneurysm* of the sinus of Valsalva into the right auricle, right ventricle or pulmonary artery. The murmur develops suddenly and is followed by progressive cardiac failure.

ii. *Aortic septal defect*, in which the murmur tends to be lower and coarser in character and the heart tends to be markedly enlarged.

iii. *Idiopathic pulmonary hypertension* with pulmonary incompetence. The other signs of a ductus are lacking although the murmur might be confusing.

iv. *Ventricular septal defect* with aortic incompetence may mimic a patent ductus with its collapsing pulse, systolic and diastolic basal murmur, left ventricular enlargement, a functional mitral diastolic murmur and pulmonary plethora. The timing of the thrill and murmur are, however, different.¹ Gross¹ has seen 12 of these as compared to 525 ductuses and states the murmur is more 'to-and-fro' than continuous.

INDICATIONS FOR OPERATION

A. In children between the ages of 3-16 years:

1. In all uncomplicated ducti operation is advised.
2. All children who are either below par, whose growth is stunted, who feel unduly tired, have limitation of exercise or have a large shunt are urged to have the operation.
3. In the presence of infection operative closure is mandatory and urgent, after preliminary and intensive antibiotic therapy.

B. In adults below the age of 40, I am of the opinion that the above criteria are still valid. This is in keeping with the attitude of Gross¹ but Campbell⁵ and Paul Wood⁴ are more conservative. They do not urge operation in asymptomatic children and advise operation only in complicated cases.

It is our experience that of 7 adults seen between the ages of 18-38 years only one was symptomless; she (Case 24) weighed only 75 lb. and was 4' 8½" in height. Of the others, 3 had late onset of breathlessness and lassitude (Case 11, aged 19 years; Case 12 aged 23 years and Case 19 aged 29 years). One (Case 4, aged 19 years) had a partially reversed shunt on effort. One (Case 16, aged 30 years) was incapacitated by breathlessness relieved by ligation, despite an aortic stenosis. Case 22, aged 38 years, had deteriorated in the 3 years since operation was first advised and refused on the advice of her family doctor to such an extent that gross pulmonary hypertension and pulmonary incompetence were present when operation was ultimately undertaken.

OPERATION

This has always been preceded by penicillin and streptomycin for 48 hours together with ascorbic acid. These have been continued for the first post-operative week. Blood counts have been used as a guide to the amount of blood to be transfused during the operation and in the immediate post-operative phase. A cut-down has always been done in the ward in the right internal saphenous at the ankle in young children, and in the distal left forearm in older children and in adults.

Anaesthesia. This has varied with the anaesthetist but, provided the patient is intubated, controlled respiration employed and good oxygenation maintained, the actual agents are of secondary importance. We have been fortunate in

having anaesthesia of the highest order. Dr. C. Frost has given 15 of the anaesthetics, Dr. F. W. Roberts 4, and Dr. Devitt, Dr. Kramer and Dr. Jeffs the others.

Approach. Although several of the most prominent American surgeons^{1, 6} advocate the anterior approach, in common with the British school we routinely employ the classical posterolateral thoracotomy approach with removal of the fifth rib. The upper lobe is displaced gently downwards, the aorta inspected to confirm that there is no undiagnosed coarctation (Case 5 had some angulation of the aorta at the site of the ductus and we have had 3 patent ductuses in 3 coarctation resections) and the ductal area palpated to confirm the presence of a thrill. We have invariably found the thrill present in the proximal part of the pulmonary artery and very rarely over the ductus itself.

Exposure of the Ductus. The mediastinal pleura is now incised parallel to and behind the phrenic nerve, extending from the aorta above, downwards over the lymphatic glands which have in all our cases covered the ductus, and so down to the pulmonary artery. The posterior mediastinal flap is elevated and the vagus nerve identified. By careful scissors dissection of the glands, fat and areolar tissue the recurrent branch of the vagus is isolated and traced back posteriorly and medially round the ductus. This is the most important landmark in isolating the ductus, which should never be sought for until the recurrent nerve has been demonstrated adequately. The adventitial tissue covering the antero-lateral surface of the ductus is now carefully freed, working from the aortic end towards its pulmonary insertion. The pericardial sac has always to a greater or lesser extent covered this aspect of the ductus and has to be dissected free, medially, until the pulmonary artery has been exposed. The sac is readily recognized by its somewhat greyish-blue translucent appearance. Dissection is then carried on over the superior and inferior aspects of the ductus by using Lahey's gall bladder forceps. These are slender, curved or angled, blunted nosed forceps, with long handles giving good access and adequate control.

We have found that these 3 aspects of the ductus can be defined readily, but the postero-medial aspect of the ductus is often difficult to define as the fibrous pericardium is firmly attached both to it and the adjacent left main bronchus. However, haste has no part in the isolation of the ductus at this stage and by gradual insinuation and opening of the forceps its nose is ultimately passed from below upwards, and the ligature material grasped. The forceps is again re-inserted and a further ligature passed round the ductus. The aortic end is tied first, securely enough to completely obliterate the thrill. The pulmonary end ligature is tied similarly and in the centre a transfixion suture is passed, encircled round the ductus and tied. This method we have employed on 14 of the 17 children, using initially number 3 twisted Chinese silk and latterly number 3 Deknatel. In 3 children no transfixion suture was possible as the ligatures were in close approximation. Of the 7 adults the above method of ligation could only be used in Case 12, aged 23 years. In case 4, a girl aged 19 years, thoracotomy showed a fistulous type of ductus with a circumference of about 4" and closure of the chest was contemplated without ligation. This patient has already been mentioned several times as a case with a partially reversed ductus. The pulmonary artery itself appeared as large as a woman's wrist. My cardiologist colleague, Dr. M. McGregor felt, however, that despite the risks of lethal haemorrhage, ligation should be attempted. The tape of an abdominal pack was therefore removed, passed round the ductus, and tied as firmly as possible against great resistance. Despite this a fine thrill was still palpable in the pulmonary artery, but it was felt that no other procedure was possible in this case.

In the remaining 5 adults similar difficulty was experienced in isolating sufficient length of ductus for the suture ligation method discussed above and umbilical tape has been used to obliterate them successfully. Those adult ductuses that we have operated upon could not be dealt with safely in any other fashion because of their friable aortic attachment.

Penicillin and streptomycin powder are placed round the ductus and in the pleural cavity, the mediastinal pleura sutured, except at its inferior end which is left open for drainage, and an intercostal catheter inserted through the 8th

or 9th space posteriorly for underwater seal drainage and the incision closed in the usual manner.

We are well aware of the attitude of Gross¹ who maintains that simple ligation in his hands carries a 10% risk of re-canulation and, because of this risk, he divides and sutures the ductus. I believe that this is the ideal surgical procedure but in average hands carries too high a mortality. This is the opinion of most British authors, viz. Tubbs² has found only one persistent leak in 73 cases, ligated; Campbell³ also advises ligation as does Paul Wood.⁴ Allison⁵ has used this method in 87 uncomplicated cases without any evidence of recurrence. Scott⁶ at Blalock's clinic (Blalock cannot be accused of temerity) reports on the suture ligation method from the clinic with one recurrence in 180 cases.

Crafoord of Stockholm also uses this technique, reserving division for selected cases.

POST-OPERATIVE CARE

1. The transfusion is carried on with slowly in the ward, especially in those cases which have had a low blood count before operation.

2. This is followed by 5% Dextrose and water to which, in adults, 3 gm. of procaine have been added to each litre and administered over the space of 8 hours to allay pain. Because of this we have found sedatives often unnecessary, and coughing made much easier.

3. If pain has persisted, Pethidine has been used during the day and Omnopon at night.

4. Very young children have usually been nursed for the first 12 hours in an oxygen tent, but oxygen administration has rarely been found necessary.

5. A portable X-ray film is taken the morning after operation, when the lung has usually been well expanded and very little evidence of pleural effusion seen. The intercostal catheter is usually withdrawn on this day.

6. The patients are given post-operative breathing exercises and leg movements by a trained physiotherapist and are encouraged to move from side to side in the bed to aid pulmonary ventilation.

7. Most patients are sat out of bed on the third post-operative day and the children are encouraged to walk round the ward on the fifth day. The adults have been treated in the same way except those cases with gross pulmonary hypertension. Case 22, aged 38 years, had had repeated attacks of bronchitis before operation and she was kept in bed for the first week because of pyrexia and cough productive of thick purulent sputum.

8. The dressing is done on the eighth day when alternate sutures are removed, the balance being removed 2 days later.

9. The average period of hospitalization in 16 surviving children has been 12.2 days. That for 7 adults has been 14.3 days. The average hospitalization following operation for the 23 surviving cases has been 12.6 days.

10. They have restricted their exercise for a month post-operatively and have regained normal activity after 6 weeks.

RESULTS OF OPERATION

Following ligation there is an immediate rise in the diastolic blood pressure, disappearance of the Gibson murmur and peripheral signs. In all 10 cases of mid-diastolic apical murmurs these murmurs disappeared. The adults have expressed a sense of well-being and freedom from symptoms, even in Case 4, in whom only a partial obliteration was possible and in whom the Gibson murmur was heard for the first time post-operatively. The children

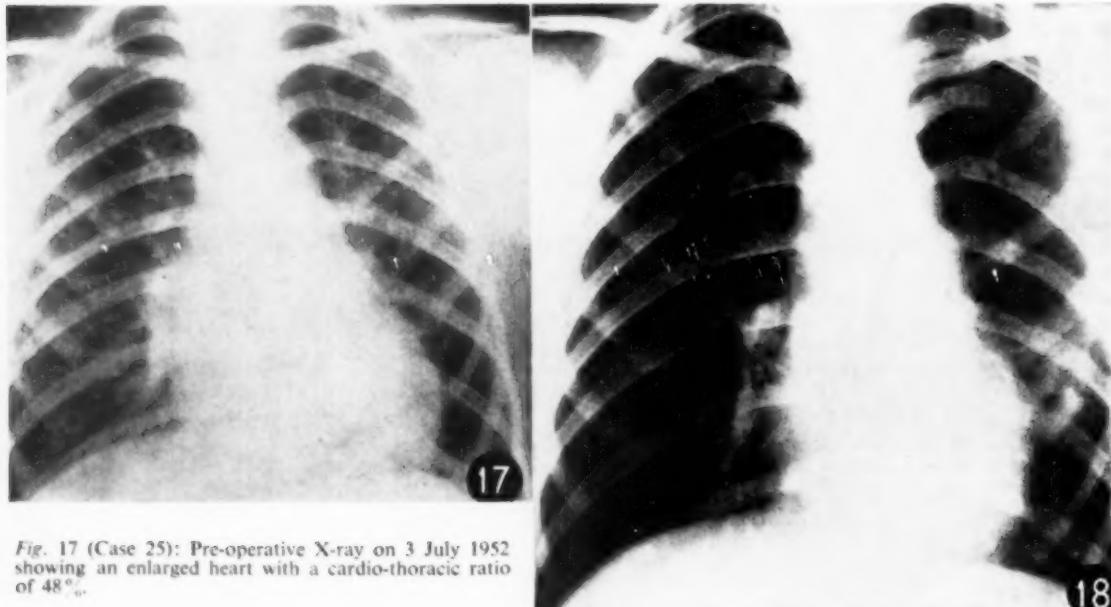


Fig. 17 (Case 25): Pre-operative X-ray on 3 July 1952 showing an enlarged heart with a cardio-thoracic ratio of 48%.

Fig. 18 (Case 25): The post-operative X-ray on 5 August 1952, 18 days after operation, shows the marked diminution in heart size with a cardio-thoracic ratio of 42%. This child had subacute bacterial endocarditis.

have all shown a marked improvement in general health and those who were underweight have all gained weight rapidly.

OPERATIVE MORTALITY

We lost the 13th case (aged 4 years 8 months) in our series of 24, from haemorrhage, giving an operative mortality of 4.1%. Scott¹⁰ reports a 2.7% mortality in 180 cases from Blalock's Clinic, Gross¹ reports an overall mortality of 2% in 482 cases divided; Tubbs⁷ a 2.5% mortality in 80 cases of ligation; Allison of Leeds⁹ no deaths in 87 uncomplicated cases and Mercer¹¹ states: 'the mortality in uncomplicated cases is under 4%'.

This operative mortality should be compared with that for cholecystectomy at the Johannesburg General Hospital for the 5 years period 1945-1949 reviewed by Lannon and Katz¹² who report a 4.1% mortality in 369 cases.

CONCLUSIONS

The patent ductus can be diagnosed with great accuracy entirely on clinical grounds. The clinical diagnosis can readily be confirmed by radiology and phonocardiography. Cardiac catheterization is used only in complicated cases and angiography on very rare occasions.

The long-term prognosis even of uncomplicated cases is poor, most having severe symptoms and incapacity in adult life when their responsibilities to their family are greatest. The pathology is remediable by fairly simple measures carrying a low mortality. Surgery should be employed in these cases whilst the patients are young, at

a time when intervention is safe and before irreversible pathological changes have occurred in the pulmonary arterial tree.

I wish to acknowledge my deep appreciation to Dr. B. van Lingden and Dr. M. McGregor of the Cardiac Clinic without whose interest, diagnostic acumen and advice much of this work could not have been performed; to Dr. Frost and the other anaesthetists without whose skill these operations could not have been so safely executed nor their convalescence been so singularly free from complications; to Mr. D. Fuller, my associate, whose help, surgical judgment and careful post-operative supervision has never faltered; to the theatre staffs of the Children's Hospital and of the Lady Dudley Nursing Home for their ubiquitous efficiency; to the staff of both institutions for so assiduously nursing the cases both pre-operatively and post-operatively; and to the very many colleagues who, by referring these patients for surgery, have shown their confidence in ligation of the patent ductus.

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NEW PREPARATIONS AND APPLIANCES

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Wyeth has recently announced the addition of a new formula to its line of gel products. This preparation is Aludrox, which is a combination of aluminium hydroxide gel with magnesium hydroxide.

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Supplied: Aludrox suspension is available in bottles of 6 and 12 fluid ounces.

The product is manufactured in South Africa, and further details are available from the distributors: Wyethal (Proprietary) Limited, 54 Station Street, East London.

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ASSOCIATION NEWS : VERENIGINGSNUUS

A PANORAMIC SURVEY OF THE FIRST HALF OF THE 20TH CENTURY IN RELATION TO THE PRACTICE OF MEDICINE

GRIMMELAND WEST BRANCH : VALEDICTORY ADDRESS BY DR S. PEREL *

We are now in the second half of the 20th century, and I thought it would be a good idea to look back to the beginning of this century and survey the changes that have occurred during the past 50 years.

Such a survey must needs be panoramic in nature, for the landscape is vast, and the time short; so, if I fail to point out some of the landmarks I trust you will overlook the omission.

Let us start by looking at the picture around the turn of the century. In England in the latter part of the 19th century there were only 4 universities which conferred medical degrees. At that time the medical curriculum extended over 4 years, and entrance to the profession was by apprenticeship. Qualified men were sharply divided into consultants and general practitioners. Gynaecologists, ophthalmologists and ear, nose and throat surgeons were being recognized as specialists, and anaesthetists were beginning to appear as whole-time co-operators. The general practitioners in the country were prosperous, for although fees were low, so were their expenses. To quite a remarkable extent they were the friends and confidants of their patients. In the cities the medical attendance on the poor was bad. This led to the organization of clubs by laymen, which did relieve the outpatients departments of the hospitals, but was characterized by certain unsatisfactory features which later furnished arguments for the introduction of National Health Insurance in Great Britain. The qualified doctors used unqualified assistants to attend to the poor, especially in certain departments of medicine such as dispensing and midwifery. In the latter the unqualified men assisted midwives who also had no proper training. Unqualified men were also employed to assist in surgeries in competition with qualified doctors, but this system of 'covering' became a professional offence in 1897. It is worth noting at that time already the cost of hospitals was rising, and the wealthy were beginning to feel the burden of taxation. The life of a doctor was interesting in itself, and materially it compared well with others in the same class of society. Mostly the doctors were unaware of the changes taking place; yet it was a time of great expectations.

In the last quarter of the 19th century the pathogenic organisms of diphtheria, typhoid, anthrax, cholera, tetanus, undulant fever, plague, syphilis, malaria and tuberculosis had been identified. As a result of these discoveries the ground was being prepared for a systematic campaign for the prevention and treatment of these diseases. So successful has this campaign been that many of them have been controlled and even eradicated in several parts of the world. As an instance of this it is worth recording that in Durban no case of malaria has been reported for 12 years; yet, when I was practising there 20 years ago we used to be inundated with cases of malaria during the rainy season. In one of the States of America (I think Mississippi) a reward of 10 dollars was offered recently for every case of malaria notified. None were reported. With diphtheria, typhoid and tetanus the story is the same. Preventive inoculation has reduced the incidence tremendously. In the Boer War enteric fever played havoc with the troops, and in the first World War tetanus proved a tremendous handicap to the armies fighting in the well-manured soils of France, causing the death of thousands of troops, yet by the time of the second World War medical progress had made such strides that it was estimated that 96% of the wounded who obtained medical care recovered.

To return to the early part of the century: X-rays had been discovered in 1895, and radium in 1898. These discoveries gave great impetus to medicine and surgery by enabling doctors to make earlier and more accurate diagnoses, and broadened the scope of treatment. These discoveries were

enhanced by the inventive genius which led to the development of the different instruments employed for viewing and exploring the cavities of the body, namely, the bronchoscope, cystoscope, gastroscope, etc.

As the latter part of the 19th century witnessed the isolation of the causative organisms of the various infectious diseases, so the first decade of the 20th century witnessed the rise of Chemotherapy. It was born of the search for new drugs with which to treat specific diseases, not vegetable extracts as in the past, but coal tar derivatives and other synthetic compounds. Ehrlich stands out as a great figure in this period. In 1909 he discovered Salvarsan or 606, and this was first tried on a human being in 1910. It produced certain toxic effects and in 1912 Ehrlich introduced 914 or Neosalvarsan. These compounds were found useful not only in the treatment of syphilis, but also for anthrax, Vincent's angina, yaws and ratbite fever. In 1920 Bayer 205 was discovered for the treatment of sleeping sickness or African trypanosomiasis. The wonders of chemotherapy were shown during the second World War, when all the known sources of quinine fell into Japanese hands, and the allies were deprived of a weapon essential to the conduct of war in the Far East. They turned to the organic chemists who produced Mepacrine, which actually proved more effective than quinine in the prevention of malaria. Since then even better preparations of these organic compounds have been synthesized.

It was in 1908 that a chemist named Gelmo in Vienna first synthesized para-amino-benzene-sulphonamide and industrial chemists exploited its use in the textile industry, notably for wool dyeing. In 1932 the therapeutic value of Prontosil was discovered and in 1933 Domagk claimed it had the power to inhibit the growth of germs in living tissues! Its use in clinical medicine proved revolutionary, as many of us will remember who used it in the treatment of pneumonia, erysipelas and puerperal fever. In 1937 Prontosil was broken down into 2 separate compounds, only one of which was effective against bacteria. This was given the name Sulphonamide or M & B 125, and it was found to be none other than the para-amino-benzene-sulphonamide first synthesized in 1908 by Gelmo! M & B 693 was first used on 18 March 1938, in England. Since then numerous other sulphonamide compounds have been elaborated and have helped to control infections such as meningitis, scarlet fever, rheumatic fever and other streptococcal and staphylococcal infections. The widespread use of Sulphadiazine has almost eliminated epidemics of meningitis and scarlet fever.

In 1912 Sir Frederick Gowland Hopkins demonstrated the part played by accessory food factors (or vitamins) in the prevention and treatment of the deficiency diseases. His pioneering work was followed by the discovery of one vitamin after another, until to-day all the known deficiency diseases can either be prevented or controlled by treatment.

Starling made clear the chemical correlation of the functions of the body through the circulation of chemical substances called hormones. This basic work led to the isolation of numerous hormone preparations from the various endocrine glands and gave rise to the branch of medicine known as Endocrinology. Insulin was discovered by Banting and Best about 1922, and about 1925 Minot and Murphy isolated Liver Extract for the treatment of pernicious anaemia. In the early 1930's the various sex hormones were isolated by Dodds and his co-workers and have proved a blessing in the treatment of endocrine disturbances occurring in men and women. The most recent discoveries of the hormones has been the isolation of ACTH from the pituitary gland and Cortisone from the adrenal gland. The miracles being performed by these wonder drugs in the treatment of Stress diseases are still amazing medical men every day.

About 1942 Fleming astonished the world with his discovery of Penicillin, and this paved the way for the numerous anti-

* Address delivered at the Annual General Meeting held at Kimberley, on Thursday, 26 March 1953.

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biotics which have been elaborated during the past 10 years. At present there are more than 200 of these substances. Some are derived from Bacterial products, e.g. Tyrothricin, Bacitracin, Polymixin and Nisin. Others are obtained from fungi, e.g. Penicillin, while still others are products of Actinomycetes, e.g. Streptomycin, Aureomycin, Chloromycetin and Neomycin. The use of these substances allied with the sulpha drugs has reduced the mortality rate from the infectious diseases to a very considerable extent.

These discoveries in the fields of bacteriology, chemotherapy, nutrition and endocrinology have resulted in a considerable increase in the average expectation of life. In the Bronze Age the average expectation of life was 18 years, at the beginning of the Christian era the average was 22 years, and it has progressively increased until at the beginning of the 20th century it had reached between 45 to 49 years. During the past 50 years the average expectation has risen to about 65 years and it may be expected to rise still further.

What is the effect of this increase in life expectancy? One effect is that the civilized world is being populated by older people. The effect of this on medical practice is that a larger part of our work to-day is connected with the treatment of heart disease, diabetes, cancer, hypertension and nervous disorders, and a smaller part with infectious diseases. There is a shift in emphasis from the infectious diseases to the degenerative diseases and the disorders of metabolism. As a result the science of Geriatrics has developed and has done much to improve the functional age of the elderly in terms of mental and bodily activity. The advances made in the treatment of peripheral vascular diseases, metabolic diseases and endocrine diseases during the past decade, and the development of radio-active isotopes in medicine, are helping daily to keep the elderly patient not only alive but comparatively well. Unfortunately this 'medicated survival' of the older section of the population carries with it a definite liability on the economic side.

The cost of medical care to-day constitutes a major economic problem in every civilized and progressive country. As an instance, in 1942 the Beveridge Report estimated the cost of a National Health Service for the United Kingdom at £170,000,000. Ten years later, in 1952, the bill amounted to £400,000,000, and was only kept down to this figure by the refusal of the Treasury to agree to all the demands made on it.

'The unparalleled progress which has been made in the last 50 years in the conquest of disease has been accompanied by a greater demand for treatment and a greater inadequacy of supply than has ever existed before in our history.' The increasing costs and the remarkable benefits that modern medicine has conferred on the people have forced governments to step in and try to provide a comprehensive medical service for those who could not otherwise afford it. For even in the past decade 'medicine has undergone little short of a revolution; it is advancing more rapidly than the capacity of our statesmen and administrators to deal with it'.

A limit however must be set to the demands made on any medical service if it is not to bankrupt itself. The difficulty is that each new discovery while relatively limited in its scope and usefulness becomes increasingly expensive. For example, Jenner's discovery of vaccination against smallpox was relatively inexpensive, and has contributed more to human health than all the antibiotics. Similarly Ehrlich's 606 was cheap and its uses widespread. Penicillin, Streptomycin and the steroid hormones ACTH and Cortisone were almost prohibitive in cost at first, and are only now becoming cheaper. If this trend continues, populations may find that in the near future they are faced with the choice, not of guns or butter, but of Cortisone or bread. It is a problem which is becoming more serious every year.

The solution of the problem may lie in two directions. Firstly, the steady progress made during the last 50 years, resulting in tremendous benefit to the health and social welfare of the people, has helped industry and commerce—in a way that some industrialists fail to appreciate. The workman is able to return to work after an injury or an attack of infectious disease much more quickly than before, and in some instances is even able to continue working while under treatment. Thus many man-hours of work are saved. Secondly, the workman is now a much fitter man physically than his

father at the same age, and he should therefore not be prepared to retire at 55 or 60 to become an added burden to the community. He should be fit enough for another 5 to 10 years, and by his labours increase the productivity of the State, and thus enable the Government better to pay its way in any medical scheme. Our profession has a part to play in this direction by lending the weight of its authority to any campaign in this direction, and by educating our patients to the idea that retirement at a later age is beneficial. Even if they are unable to continue working at their previous occupations it is advisable to draft them to work more suitable to their advancing years, rather than to idle away the remaining years of their lives.

After all, who knows but that some modern Voronoff may one of these days perfect a new serum or a glandular extract which will call a halt to the ravages of arteriosclerosis and other degenerative diseases, and so enable us to live and work well beyond the biblical three score years and ten?

One of the most notable features of this half-century is the desire of the individual for social security. Psychiatrists have found an explanation for this need, but we cannot go into such detail to-night: sufficient to our purpose is the fact that the individual has become such an insignificant cog in the modern economic machine, most of the workings of which he cannot comprehend, that he feels lost and insecure, and this has led to his desire for state control and state direction. As far as medical practice is concerned, it has manifested itself in a desire on the part of the state to control medical services as in the State medical services of New Zealand and Britain. Another aspect of the desire for security against sickness has been the development of medical aid societies during the past generation, especially in countries like South Africa where no State medical service exists. This is similar to the pre-payment scheme in the United States, where millions belong to such societies. Here in South Africa the movement is on a smaller scale, but even so the number of societies has grown rapidly until now there are over a hundred recognized by the Association. One of the largest (National Medical Aid) has a membership of 6,000. The growth of this movement should be encouraged by the Association because it will delay the creation and postpone the demand of the public for a State medical service, which South Africa cannot afford and which none of us want particularly.

In passing it should be noted that in achieving social security the individual is in no small danger of losing his independence and his freedom, and thus becoming more easily a prey to the ideas of Communism and Fascism. We thus may find that towards the end of this century people may live longer in doubtful security, but they may have exchanged the individual freedom and independence of the past for a type of feudal serfdom (20th century style) where they are bound hand and foot and mind to the State.

I have not said anything of tuberculosis, one of the greatest scourges of this century, and so closely associated with the slums of our highly industrialized civilization. However, it is significant that in various countries the death rate from tuberculosis in 1947 was less than one-fifth that at the beginning of the century. With the aid of the newer anti-tuberculosis drugs such as Isonicotinic-acid hydrazide, P.A.S., Streptomycin, Neomycin, and the much improved techniques of thoracic surgery, the death rate should diminish much more during the next decade or two.

The list of discoveries I have mentioned is a formidable one, and yet the march of science goes ahead with ever increasing speed, pushing the frontiers of medicine further into the unknown—exploring ever more into the mind and soul of man, into the chemistry of his internal secretions, into his nutrition and metabolism, into the laws which govern the relationship of cells (normal and malignant), into every aspect of the human body with its delicate compensatory mechanisms.

We are now once again in a time of great expectations, with the public in collaboration with the practitioners of medicine. In the early part of the century this was not so, for then medicine was isolated from the people on whom it was practised, and the medical men stood in a class apart. This attitude is now disappearing, helped on its way by the abolition of class distinctions, the standardization of dress and the introduction of mechanical transport. The frock coat, silk

hat and striped pants of the early part of the 20th century have become out of date (though I well remember some of my older colleagues sporting such clothes when I first came to Kimberley). To-day in the warmer weather some of our doctors have resorted to 'bush jackets' and some have even discarded their jackets altogether. The fine work done by the medical profession during the past half-century has brought doctors and patients closer together, and made the latter realize more than ever the important part we play in modern society. An intense interest is displayed in articles in the Press, medical talks on the radio, and medical themes for the screen.

In a world beset by doubt and uncertainty, in an era which has witnessed 2 World Wars, during which man has descended

to the lowest depths of degradation and cruelty towards his fellow men, it is comforting and stimulating to see the heights to which medical scientists have risen in the striving to discover the means whereby human suffering can be alleviated. They have placed in our hands during the past 50 years powerful weapons whereby medical men have been enabled to play a great part in changing the social, industrial and political life in our times.

They have made it possible for a well-known American physician Dr. Dochez, to exclaim: 'In the past the public expected a doctor to perform miracles; now, thanks to modern science, he is performing them daily.' This, to my mind, epitomizes the change that has taken place in medical practice in the past half-century.

GRIQUALAND WEST BRANCH

ANNUAL GENERAL MEETING AND GENERAL MEETING HELD AT KIMBERLEY, ON THURSDAY, 26 MARCH 1953

Dr. S. Perel was in the chair, and there were 19 members present.

ANNUAL GENERAL MEETING

The Balance and Treasurer's Report were read and adopted. For the sake of economy, it was decided that all work in future be done by the elected Honorary Office-Bearers instead of by a financial firm.

The following Office-Bearers were elected:

President: Dr. J. Kretzmar.

Vice-President: Dr. J. E. Vaughan Jones.

Honorary Treasurer: Mr. N. Kretzmar.

Honorary Secretary: Dr. L. Schrire.

Honorary Assistant Secretary: Mr. A. B. de Villiers Minnaar.

Branch Council Members: The above executive plus Drs. S. Perel, H. Lowenthal, D. E. Stephens, G. T. Tandy, J. P. Collins and N. Weinberg.

S.A. Blood Transfusion Service: Dr. J. P. Collins (alternate: Dr. A. A. Shein).

Cripple Care: Dr. J. E. Vaughan Jones.

K. and N.C. Mental Health Society: Dr. G. E. de V. de la Bat.

K. and N.C. Committee of Alcoholism: Dr. G. T. Tandy.

Dr. S. Perel then delivered his valedictory address on *A Panoramic Survey of the First Half of the 20th Century in Relation to the Practice of Medicine*. After discussion, the meeting closed with a vote of thanks to the chair.

GENERAL MEETING

The Branch was notified of the nomination of Dr. J. P. Collins to the Presidency of Federal Council. The news was accepted with acclamation, as redounding to the credit of himself and the Branch.

The question whether it was ethical to treat Rhesus babies with Erythroblastosis in Kimberley was raised. It was pointed out that there is no ethical reason against this. It is not always possible, for economic or temporal reasons, to transfer the baby to Johannesburg. If it is a matter only of not having the requisite equipment, this should be obtained.

Other business was transacted and the meeting was closed with a vote of thanks to the chair.

REPORT OF A CLINICAL EVENING HELD BY THE CAPE WESTERN BRANCH OF THE MEDICAL ASSOCIATION OF SOUTH AFRICA AT WOODSTOCK HOSPITAL, CAPE TOWN, ON 27 MARCH 1953

Hypopspadias in 2 young children: Dr. M. Retief demonstrated 2 cases of glandular hypopspadias in infants, one aged 2 months and the other 6 months. Dr. Retief explained that the indications for operation for hypopspadias were:

1. Functional—to ensure proper sexual function in adulthood;
2. Psychological—so that the penis would not be an object of curiosity throughout life;
3. Urological—to ensure a good urinary stream.

In these cases no chordee was present, even when the penis was erect, so that from a functional point of view there was no indication for operation. Nor was there in these cases any psychological need to operate, as the appearance of the penis could not be improved to any appreciable extent. In one case the urinary meatus was extremely narrow, which caused the baby to cry when urinating and for this reason a meatotomy had been done.

Several members took part in discussing the problem of hypopspadias and in reply Dr. Retief said that a full urological investigation was only indicated if there were signs of urinary sepsis. More advanced cases of hypopspadias, like the penile and perineal, require operation; firstly to correct the chordee, and at a later stage to bring the urethra as near the tip of the penis as possible. The optimum time for doing the first operation was 18 months to 2 years, and the second operation between 4 and 6 years, so that all operative procedures could be completed by the time the patient went to school.

Phimosis in a child of 4 years: Dr. A. J. Gans showed this case of a coloured boy who definitely needed circum-

cision and then went on very ably to discuss the indications for circumcision. He said that he personally was in favour of routine circumcision of male infants during the first week of life. He favoured this view because it was hygienic, it removed the possibility of paraphimosis, it led to a lower incidence of venereal disease in later life, it almost entirely prevented the occurrence of carcinoma of the penis in later life, and moreover it was a simple operation to do on a young infant, with extremely low mortality and morbidity.

A lively discussion followed. Dr. J. W. Rabkin said that he was opposed to the routine circumcision of infants because it was unnecessary and unphysiological. The foreskin of an infant normally became retractable during the first 12 to 18 months of life, and he did not agree with Dr. Gans that in the upper social classes it was unhygienic to have a foreskin. Dr. S. Dubb sided with Dr. Rabkin and gave his reasons for being against the routine circumcision of infants. Dr. J. H. L. Shapiro agreed with Dr. Gans and gave several cogent reasons why he favoured routine circumcision.

The Chairman curbed further discussion owing to lack of time.

Ruptured bowel in a young child: Dr. S. Sieff discussed a case recently admitted to Woodstock Hospital who had been involved in a motor car accident. He had minimal signs of an abdominal catastrophe, so much so that he was kept under observation for 12 hours before an X-ray in the erect position was taken. This showed air under the left diaphragm and operation confirmed the diagnosis of a ruptured bowel. The rupture had occurred in the small

intestine, and half a pint of bowel content was found free in the peritoneal cavity. Dr. Sieff pointed out the difficulty of making the diagnosis on clinical signs, and the great reliance which had justifiably been put on the X-ray appearance of free air in the abdominal cavity.

Dr. J. Wolf Rabkin congratulated Dr. Sieff and Dr. W. Wilkie, who had operated on this case. Dr. Jerome Rabkin and Dr. A. E. Flax enquired when in such cases they would expect to see free air in the abdominal cavity. Dr. Forsyth answered that he thought that clinical signs were delayed by a sealing off of the rupture by prolapsing mucous membrane and that symptoms would arise when active peristalsis commenced and broke down this temporary sealing off. He felt, however, that gas would appear before free fluid. Dr. Wilkie expressed the opinion that an X-ray taken too early might be misleading, in that if there was no gas present in the peritoneal cavity the diagnosis might be missed in small bowel ruptures. Because of the non-infected nature of the condition signs and symptoms were often delayed for many hours. Large bowel ruptures early gave signs of peritonitis. Dr. F. O. Fehrenz stressed the advisability of exhaustive investigations in these cases, and quoted a case where a doctor had become liable for action in missing the diagnosis. Dr. S. T. de Kock also stressed the great difficulty of diagnosis and wondered whether all cases who had suffered severe trauma to the abdomen should not be explored. He quoted a similar case which had given great difficulty in diagnosis at Wynberg Hospital. Dr. Dubb mentioned a case where air had been found under the diaphragm, and full recovery had followed non-operative observation only. This case, however, was also a chest injury, and the air may have penetrated the diaphragm from the chest. Dr. Wilkie agreed with the last speaker and mentioned several cases of which he had knowledge which had recently occurred at Groote Schuur Hospital where air in the peritoneal cavity had been found, but where it had probably come from an associated lesion of the chest and diaphragm. Dr. W. L. Phillips suggested that in such cases air in the abdomen might originate from lesions of the oesophagus and that he felt that this possibility should be carefully borne in mind. Dr. J. H. L. Shapiro recounted a similar case under his care, where the diagnosis had been extremely difficult until the patient had been examined in the knee-chest position and splashing had been elicited by palpating the abdomen.

Adenoma of the thyroid in a young female: Dr. Wilkie discussed this case with a large lump in the right lobe of the thyroid gland. The woman showed no evidence of toxicity. He supported the idea of operative removal because adenomas of the thyroid were liable to certain complications: viz. (1) haemorrhage into the adenoma; (2) cystic degeneration of the tumour; (3) calcification of the tumour; (4) the almost certain eventual development of toxicity, and (5) malignancy in the adenoma, which he said occurred in 5% of cases.

He recommended the immediate removal of adenomas of the thyroid, provided they did not show signs of toxicity when pre-operative treatment with Lugol's iodine was first given. In answer to a question from Dr. J. Rabkin, Dr. Wilkie said it was surgically possible to remove the whole adenoma completely. Dr. Wolf Rabkin quoted a case 4 years old with exophthalmic goitre, which in his opinion was of very singular occurrence.

Radical operation for ingrowing toenail: Dr. M. I. Bruk showed the case of a policeman who had suffered for many years with an ingrowing toenail, and on whom the usual operative procedures had not met with success. Dr. Harold Lee had then done a radical removal of the nail, its bed and the terminal half of the distal phalanx. This had resulted in permanent cure and the patient was able to play football again after this.

Dr. Wilkie congratulated Dr. Bruk and Dr. Lee on their result, but warned that such cases should always be carefully examined for any associated peripheral vascular disease of the extremities. Dr. Bell agreed that this radical operation was an excellent one, and that he had known ballerinas to be able to continue their activities after such an operation. It was, however, rather disfiguring and he wondered whether if the nail and its bed were completely removed and a skin graft applied, one would also not get an excellent result. Dr. Forsyth felt that this operation for the usual case was too drastic. He explained in detail that if the nail, and

particularly the nail bed were meticulously removed, he personally had had excellent results by a less radical procedure. Dr. M. Helman also advocated conservative treatment even before operative treatment of any nature was undertaken. Dr. J. H. L. Shapiro agreed with the previous speaker and said that he had had excellent results with very conservative treatment, and he discussed the genesis of ingrowing toenails.

Osteomyelitis of the tibia in a young child: Dr. Hamilton Bell demonstrated a case where extensive osteomyelitis had occurred in the tibia while under adequate antibiotic treatment. He quoted 3 cases that had recently come under his care, in one of whom the result had been disastrous because the head of the femur and its epiphysis had been destroyed. He takes the view that in many cases the antibiotics merely mask the symptoms and he feels that when the diagnosis of osteomyelitis has been made the bone should be opened. He feels that the fear to open the bone in these cases is unwarranted. Antibiotics, except in exceptional cases, will not stop the spread of the disease, and he advocates that unless the signs and symptoms, including pain, abated within a short period of time, probably within 48 hours, the case should be operated on and the bone opened.

In the discussion Dr. J. Rabkin wondered whether it was always possible to diagnose these cases sufficiently early on clinical signs. Dr. Bell answered that he felt that the majority of cases could be diagnosed early, except those where septicaemia was the dominant feature. In this type of case the antibiotics would be useful. Dr. Wolf Rabkin stressed the importance of early diagnosis and reminded members that all children with fever should be carefully examined and palpated all over to exclude the possibility of an early osteomyelitis. Dr. Helman wondered if the early opening of bones was not too drastic. He said that in practice antibiotics were frequently used with success in such cases. Dr. Bell answered by saying that unless antibiotic treatment had dramatic success within a short time he would favour immediate and urgent operation to prevent the extensive spread of osteomyelitis. One found in these cases, he said, when operated late, a large collection of pus which was sterile but which nevertheless destroyed the bone and adjacent joint structures. He also pointed out that since the use of antibiotics, Brodie's abscess had become much more common. Dr. S. Shulman supported Dr. Bell in favouring early operation for osteomyelitis. If the signs and symptoms did not settle within 24 hours he would operate. He pointed out that the incidence of pathological fractures in these cases was high. He also said that one should check not only specimens of the pus but also of the bone by culture and give the appropriate antibiotic afterwards. Dr. Shulman did feel, however, that he would be content to drill holes into the bone rather than extensive guttering thereof. Dr. J. H. L. Shapiro thanked Dr. Bell for his emphatic approach to this urgent problem, which so often beset the general practitioner. Dr. Adolph Meyer said that he frequently gets requests from practitioners asking for an X-ray of a bone to exclude osteomyelitis. His reply invariably is that the diagnosis can usually not be made in the early stages of the disease and that the X-ray changes frequently do not become apparent until after 14 days. Dr. Bell replied

Sprengel's Disease of the Shoulder: Dr. R. L. Forsyth demonstrated and discussed the pathology and treatment of a very beautiful example of Sprengel's disease of the shoulder joint. Since time was getting on, the discussion on this case also had to be curtailed.

Thymus enlargement in children: Dr. Wolf Rabkin showed the X-rays of 2 young infants with enlargement of the thymus gland. He demonstrated the dramatic response to deep X-ray therapy. He felt that this condition should be borne in mind whenever an infant showed signs of obstruction to breathing or swallowing, and pointed out that an authority like Potter had found 11 cases in 100,000 admissions to a children's hospital.

Dr. Helman enquired whether the X-ray appearance could not be produced by a retrosternal thyroid enlargement. Dr. Rabkin replied that he had never yet seen a retrosternal thyroid in a new-born child. Dr. Joffe explained that a retrosternal thyroid could be excluded in these cases because the X-ray appearances were quite different from that of an enlarged thymus. Dr. Adolph Meyer supported this view,

but said that enlargement of an ectopic thyroid does occur in children. The radiological diagnosis is usually quite clear. Dr. Phillips discussed this interesting problem and said that from a practical point of view the question often arose as to the need for a tracheotomy. He explained the indications for such a necessity.

Demonstration—Application of strapping and plaster of Paris

to the ankle joint: Dr. Bell gave a short but extremely practical demonstration of the method in which a sprained ankle should be supported by extension adhesive strapping. He then also demonstrated a neat and practical way of setting up a Pott's fracture of the ankle joint in plaster of Paris.

P. J. M. Retief.

SOUTHERN TRANSVAAL SUB-GROUP OF NEUROLOGISTS, PSYCHIATRISTS AND NEUROSURGEONS OF THE M.A.S.A.

At the Annual General Meeting of the above sub-group held on 25 March 1953 the following office bearers were elected:
Chairman: Dr. M. Peskin.

Honorary Secretary/Treasurer: Dr. A. Sidley.
Executive Members: Dr. E. M. Kerr, Dr. M. Fe'dman, Dr. D. Perk, Dr. T. Lynch.

PASSING EVENTS : IN DIE VERBYGAAN

Dr. P. M. Bremer has commenced practice as a specialist in Obstetrics and Gynaecology at 60 Van Riebeek Medical Buildings, Schoeman Street, Pretoria.
 Telephones: Rooms 3-8309; Residence 70-4420.

THE CAPE TOWN PAEDIATRIC GROUP

The next meeting of the Cape Town Paediatric Group will be held at Groote Schuur Hospital in the Large (E.4) Lecture Theatre on Friday 8 May at 8.15 p.m.

Dr. John Hansen, M.R.C.P., D.C.H. recently returned from the United States, will speak on: 'The Effects of Withholding Fluids in the Immediate Post-Natal Period'.

FIRST WORLD CONGRESS ON FERTILITY AND STERILITY

The First World Congress on Fertility and Sterility, sponsored by the International Fertility Association in conjunction with the American Society for the Study of Sterility, will be held from 25-31 May 1953 at the Henry Hudson Hotel, New York. There will be scientific sections as well as a scientific exhibition and a motion picture exhibition. The registration fee (which should be sent to the Chairman, Arrangements Committee, World Congress of Fertility and Sterility, 1160 Fifth Avenue, New York 29, N.Y., U.S. America) is \$10 for the Congress, and \$15 for a copy of the printed Transactions of the 1953 Congress.

THE STUDY OF STERILITY

As it is 15 years since Greenhill last made a survey of the results of tubal plastic operations for tubal occlusion, the American Society for the Study of Sterility is now interested in learning of further experiences in this type of procedure.

Those interested in assisting this survey should communicate with Dr. Herbert H. Thomas, 920 So. 19th Street, Birmingham, Alabama, United States of America, who would be glad to forward a questionnaire for completion.

NUFFIELD GERONTOLOGICAL RESEARCH FELLOWSHIP

The Nuffield Foundation, as part of its programme for the care of old people, is prepared to offer a Nuffield Research Fellowship, of professional status, for research on the scientific aspects of ageing, or alternatively one or more fellowships of less senior status.

Applications for both types of fellowship are invited, and appointment will be made by a committee representing the Royal Society and the Nuffield Foundation. The fellowship, which may be tenable at any university in the United Kingdom, will be open to applicants of either sex—usually not more than 45 years of age—who are of high merit and whose ability fits them for the conduct of original scientific research. Appointment to the senior award will normally be made for a period of 5 years and may be renewed for further periods of 5 years. The value will not be less than £2,000 p.a. plus superannuation and child allowance. Research expenses will be met by the Foundation, including such provision for research assistants, apparatus and technicians as the committee may think appropriate.

In the event of one or more less senior workers, instead of one senior, being appointed, the period of appointment will be 3 years in the first instance. The value will be £1,000 p.a. to £1,500 p.a. plus superannuation, child allowance, and research expenses.

Applications must be received before 1 June 1953 by the Secretary, The Nuffield Foundation, Nuffield Lodge, Regent's Park, London, N.W.1, from whom full particulars and application forms can be obtained.

L. Farrer-Brown,

Secretary of the Nuffield Foundation.

In the case of applicants from the Dominions, particulars and application forms can be obtained from the Secretaries of the Foundation's advisory committees overseas. South African applicants should write:

Honorary Secretary,

Nuffield Foundation,

South African Liaison Committee,

University of the Witwatersrand,
 Johannesburg.

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The Sixth International Congress of the International Union Against Cancer is to be held at Sao Paulo, Brazil, during July 1954. The Congress is to be of a nature which will be of interest to biological and medical experts and will be presided over by Prof. Antonio Prudente, of Sao Paulo. Members expecting to attend this Congress should communicate with the Secretary of the International Union Against Cancer at 6 Avenue Marceau, Paris (8e), France.

THE AMERICAN SOCIETY FOR THE STUDY OF STERILITY

The following publications are now available from this Society at 20 Magnolia Terrace, Springfield, Massachusetts, United States of America:

1. *Transactions of the 1947 Conference* (pp. 189). \$1.

2. *Evaluation of the Infertile Couple: An Outline of Minimal Diagnostic Studies and Diagnostic Procedures Approved by the American Society for the Study of Sterility*: 25 cents per copy.

OBITUARY

We refer with deep regret to the death of Dr. Zacharias Johannes de Beer, of 'Soete Inval', Palmyra Road, Newlands, Cape, which occurred on 8 April in Groote Schuur Hospital. Dr. de Beer was taken ill suddenly on the evening of 7 April while driving his car, and died a few hours later.

Dr. de Beer was held in the highest esteem by his many friends, by whom his loss is deeply felt. He was long connected with the Association, having been a member of the Cape Western Branch Council and the Federal Council. The funeral was held on 10 April, and was attended by many of his medical colleagues.

We shall later publish an appreciation of Dr. de Beer's life and work.

COST-OF-LIVING ALLOWANCE

For the information of members of the Association the revised schedule of cost-of-living allowances payable from 16 March, 1953, is appended. This replaces the schedule published in April 1952.

	Remuneration per month			Cost-of-Living Allowance per month		
	£	s.	d.	£	s.	d.
Up to and including	4	6	8	2	6	7
Above	4	6	8—5	2	16	4
	5	8	4—6	10	0	7
	6	10	0—7	11	8	7
	7	11	8—8	13	4	1
	8	13	4—9	15	0	11
	9	15	0—10	16	8	5
	10	16	8—11	18	4	3
	11	18	4—13	0	19	2
	13	0	0—14	1	12	2
	14	1	8—15	3	4	1
	15	3	4—16	5	0	3
	16	5	0—17	6	8	4
	17	6	8—19	10	0	8
	19	10	0—21	13	4	0
	21	13	4—23	16	8	0
	23	16	8—26	0	26	0
	26	0	0—28	3	4	4
	28	3	4	14	14	8

If the ordinary weekly remuneration, plus cost-of-living allowance payable thereon, to any employee in terms of this Regulation, is at a rate which exceeds £18 per week, the weekly allowance payable to such employee shall be an amount equal to the difference between the said remuneration and £18. Any employee whose ordinary weekly remuneration is in excess of £18 is not entitled to cost-of-living allowance.

Note: Cost-of-living allowance must be reflected in a separate column in all wage registers.

THE BENEVOLENT FUND

The following contributions to the Benevolent Fund during January and February 1953, are gratefully acknowledged:

Votive Card: In Memory of:

Mrs. E. H. Collins by Dr. F. Walt.
Mr. Alpheus Williams by Dr. Vernon Brink.
Granny Frielinghaus by Dr. F. O. Fehrsen.
Douglas Smale-Adams by Dr. A. J. Orenstein.
John Hein Knoblauch by Dr. J. P. Immelman.
Dr. and Mrs. F. Krone, Dr. and Mrs. A. W. Sichel, Dr. E. G. van Hoogstraten, Dr. and Mrs. A. Marais Moll, Dr. Jack Smith, Dr. E. C. Greenfield, Dr. P. A. Smuts.
Austin Rogers by Dr. and Mrs. M. Meyers.
Dr. Hellene Scholtz by Dr. E. G. van Hoogstraten.
Mr. M. Schrire by Dr. A. W. Sichel.
Dr. R. Johnstone by Dr. Lance Knox.
Mrs. Blevins by Dr. Vernon Brink.
Mr. S. B. Asher by Dr. Eva Binion.

Total Amount Received from Votive Cards £21 10 0

Services Rendered to:

Dr. Emilia Krause by Mr. J. A. Douglas, Dr. D. C. Devitt and Dr. M. Weinbren.
Dr. R. Theron by Drs. I. Sacks and R. Tahan.
Dr. B. Spangenberg by Dr. H. A. Hallatt.
The Klipfontein Organic Products Corporation during the absence of Dr. J. B. Lurie by Dr. P. J. Dalton.
The late Mrs. Dr. C. M. Murray by Drs. F. H. Wood and Helen Brown.

DUURTEOESLAG

Vir inligting van lede van die Vereniging word die hersiene lys van duurtetoeslæ, betaalbaar van 16 Maart 1953 af, hieronder aangegee. Dit vervang die lys wat in April 1952 uitgegee was.

	Betaling per maand			Duurtetoeslag per maand		
	£	s.	d.	£	s.	d.
Tot en met	4	6	8	2	6	7
Meer as	4	6	8—5	8	4	4
	5	8	4—6	10	0	7
	6	10	0—7	11	8	7
	7	11	8—8	13	4	1
	8	13	4—9	15	0	11
	9	15	0—10	16	8	5
	10	16	8—11	18	4	3
	11	18	4—13	0	19	2
	13	0	0—14	1	12	2
	14	1	8—15	3	4	1
	15	3	4—16	5	0	3
	16	5	0—17	6	8	4
	17	6	8—19	10	0	8
	19	10	0—21	13	4	0
	21	13	4—23	16	8	0
	23	16	8—26	0	26	0
	26	0	0—28	3	4	4
	28	3	4	14	14	8

Indien die gewone weeklikse loon, plus duurtetoeslag daarop, wat aan enige werknemer in terme van hierdie reglement betaalbaar is teen 'n koers is wat £18 per week oorskry, moet die weeklikse toeslag aan sodanige werknemer betaalbaar 'n bedrag wees gelykstaande aan die verskil tussen sodanige loon en £18. Enige werknemer wie se gewone weeklikse loon meer as £18 is, is nie op duurtetoeslag geregtig nie.

Let wel: Duurtetoeslag moet in 'n aparte kolom in alle loonregisters aangedui word.

*Mrs. Dr. S. J. Lachman by Dr. T. Schneider.
Dr. J. D. Mohr by Drs. F. Petersen and E. G. van Hoogstraten.
Dr. J. Hollings by Dr. G. Awerbuch.
Lynne, daughter of Dr. M. J. F. Davis by Mr. L. Fatti, Mr. G. R. Crawshaw, Dr. G. Hochschild and Dr. F. P. Reid.
The wife of Mr. I. Norwich by Dr. Jack Chaskalson.
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Mrs. Dr. D. J. J. Ackermann by Dr. Ruby Sharp.
Dr. D. R. McCartney by Drs. A. L. Jackson, J. T. Rossouw, C. Becker and W. K. F. Collender.*

Total Amount Received from Services Rendered ... £279 4 0

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By members of the Northern Districts Division of Natal Inland Branch	20 0 0
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Dr. G. F. van der Merwe	2 2 0
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Dr. M. Myers	1 1 0	Dr. K. P. Haslop	1 1 0
Dr. R. D. Osler	10 0	Dr. A. J. P. Graham	16 0
Dr. A. J. Ballantine	1 1 0	Dr. L. R. Tibbit	10 6
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Dr. J. P. Immelman	11 0	Dr. A. R. Bain	10 0
Dr. S. A. Lange	16 0	Dr. D. G. Cowie	10 6
Dr. G. C. Linder	11 0	Dr. J. Kleinman	10 6
Dr. F. W. F. Purcell	1 5 0	Dr. B. Epstein	10 6
Dr. H. Carey Venis	10 0	Dr. H. A. Hahn	1 1 0
Dr. R. D. Wolf	10 0	Dr. P. H. Kampfraith	5 0
Dr. A. T. F. Maske	1 1 0	Dr. H. I. Maister	2 2 0
Dr. A. W. S. Sichel	1 1 0	Dr. J. D. M. Claassens	1 0 0
Dr. G. C. Cruywagen	6 0	Dr. B. M. Porter	1 1 0
Dr. R. Drummond	5 0	Dr. C. Ross	10 6
Dr. F. K. te Water Naudé	1 1 0	Dr. F. S. Drewe	10 0
Dr. J. Neumann	13 0	Dr. E. R. Hafner	1 1 0
Dr. C. P. J. Bester	9 0	Dr. R. Resnekov	1 1 0
Dr. I. Goldberg	11 0	Dr. G. Kloekner	2 2 0
Dr. I. Sagor	5 0	Dr. Klein	1 1 0
Dr. B. Krikler	5 0	Dr. D. J. van der Westhuizen	1 1 0
Dr. F. R. Luke	5 0	Dr. R. L. Forsyth	1 1 0
Dr. J. H. Symington	10 6	Dr. M. Elion	1 1 0
Dr. R. Glasser	17 0	Dr. L. Tomory	1 1 0
Dr. J. van Schalkwyk	10 0	Dr. W. J. Naudé	1 1 0
Dr. E. E. le Roux	1 1 0	Dr. H. L. Wallace	5 0 0
Prof. E. C. Crichton	10 0	Dr. C. Weinberg	10 6
Dr. P. A. Euvar	1 1 0	Dr. O. W. J. Wynne	10 6
Dr. E. Cahl	1 5 0	Dr. I. W. F. Spencer	10 6
Dr. D. F. Anderson	10 0	Dr. B. P. Friedland	10 6
Dr. N. L. Murray	1 0 0	Dr. J. T. Russell	1 1 0
Dr. A. A. Cilliers	5 0	Dr. H. J. E. Schultz	10 6
Dr. M. H. Campbell	10 0	Dr. J. A. Lawrence	10 6
Dr. J. Walker	10 6	Dr. M. Maister	10 6
Dr. D. J. J. Bezuidenhout	1 4 0	Dr. K. M. Brower	5 0
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Dr. J. A. Currie	1 1 0	Dr. W. Pienaar	10 6
Dr. C. S. A. O'Malony	5 0	Dr. C. C. L. Murray	7 0
Dr. L. Sive	10 6	Dr. A. Glatt	1 1 0
Dr. M. Zabow	10 6	Dr. S. Kahn	10 6
Dr. S. Sanders	10 6	Dr. A. B. Rossouw	10 6
Dr. E. G. Hales	1 0 0	Dr. G. H. de Vos	5 0
Dr. P. B. Moore	7 0	Dr. F. Krone	10 0
Dr. R. Burns	1 1 0	Dr. F. T. Waldron	7 0
Dr. A. J. de Villiers	2 6	Dr. I. M. Hurwitz	6 0
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Dr. H. O. Hofmeyr	6 0		£1,040 18 8
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Dr. F. G. Shearing	1 1 0		
Dr. J. L. van Selm	1 1 0		
Dr. J. G. Landsberg	1 5 0		

IN MEMORIAM

DR. N. A. STUTTERHEIM

Dr. N. A. Stutterheim writes: After a long and painful illness Dr. Nicolaas Anton Stutterheim passed away on the 19th February 1953 in Johannesburg, a fortnight before his 80th birthday.

He was born in 1873 in Middelburg on the island of Walcheren, Holland, and as the eldest son of a minister of the local protestant church he was expected to follow his father's calling, although his inclination was against it. After 5 years at the Theological College at Utrecht, just before his final examinations, he announced his decision to study medicine instead. Parental support to his new undertaking was withdrawn and to earn a living he rose to the rank of lieutenant and was one of the guard of honour at the coronation of Queen Wilhelmina in 1898.

During his years as a medical student he was stimulated by President Kruger's visit to Holland and decided to emigrate to South Africa on the completion of his studies

in Holland in 1904 and after obtaining a further qualification in London in 1905. He started practice as locum to Dr. Juriaanse in Ermelo and later settled in Bethal in the Transvaal. He revisited Holland to marry Miss Elizabeth van Nouhuys of Leyden, by whom he had 5 children. After World War I he again went to Holland to specialize in ophthalmology. On his return to South Africa he practised in Ermelo before moving to Johannesburg in 1926, where he remained until his death.

In 1928 he commenced his brilliant work in the field of binocular vision and in 1929 he received the first M.D. awarded by the University of the Witwatersrand. His thesis was published as a monograph supplement to the British Journal of Ophthalmology in 1931. He devoted the rest of his life to the problems of eyestrain and squint in particular, and published many articles and 3 books on these subjects.

He was a member of the Medical Association of South

Africa for many years and also of the Ophthalmological Society of South Africa.

In 1951 he was awarded the Senior Captain Scott medal of the Biological Society of South Africa for meritorious service in the realm of human physiology. His last monograph, published in 1950, was dedicated to Sir Charles Sherrington, whom Stutterheim had visited in England in 1949.

After the death of his wife in 1926 he married Miss

Gertruida Roos, his surviving wife, whose devotion to him and to his work was wonderful to see.

The multitude of grateful patients who, over a quarter of a century, passed through his unique clinic for the treatment of exestrain and of squint will carry his name down through generations. The hundreds who attended his funeral bore testimony to the wonderful personality of a kind, dignified man whose patience and quiet authority endeared him to all.

Nomen toto sparget in orbe suum.

REVIEWS OF BOOKS

BIOCHEMISTRY

Biochimie Médicale. By Michel Polonovski, P. Boulanger, M. Machéboeuf, J. Roche. (Pp. 813. Fifth Edition. 4,000 francs.) Paris: Masson et Cie.

Contents: 1. Constituants de la Matière Vivante. 2. Sucs Digestifs et Processus Enzymatiques Dans Le Tube Digestif. 3. Métabolisme Intermédiaire. 4. Tissus, Humeurs, Sécrétions. 5. Excrétion. 6. Échanges Nutritifs et Nutrition. Index Alphabetique des Matières.

This is the second important work to be published under Prof. Polonovski's editorship in the past year. Whilst his *Pathologie Chimique* was directed to the clinical pathologist and physiologist, the present volume is written 'by doctors for doctors'. Admittedly didactically, the contributors have presented accepted and proven concepts of the physiological basis of medicine, and they have succeeded in bringing the work as up to date as possible.

An innovation is the appendix to each chapter of a selected list of further reading for those who wish for more detailed studies and description. On the other hand, one wonders how much the practising doctors—for whom this book has been written—appreciate the sections on enzyme chemistry and amino acid and steroid formulae, not to mention the structural chemistry of the fungoid antibiotics.

It is difficult for anyone who was not in Occupied Europe in the last war not to shudder on reading, in the introduction to a major scientific work such as this, that a contributor to previous editions is deplorably absent because 'Arrêté en Mars 1944, et déporté en Allemagne, il y fut lâchement assassiné quelques heures avant la libération de son camp, par des criminels qui, ayant soumis à l'expérimentation médicale et à la mort des centaines d'enfants innocents, ont voulu faire taire à jamais sa voix accusatrice.'

This is a textbook of great scholarship containing a wealth of information and clear exposition.

PAIN IN LABOUR

The Practical Management of Pain in Labour. By W. D. Wylie, M.A., M.B. (Cantab.), M.R.C.P. (Lond.), D.A. (Pp. 148 + xii, with 42 Figures. 18s. 6d.) London: Lloyd-Luke (Medical Books) Limited.

Contents: Preface. 1. Anatomical and Physiological Considerations. 2. Analgesic and Anaesthetic Agents. 3. Apparatus. 4. Relief of Pain in Normal Labour. 5. Abnormal Pregnancy and Childbirth. 6. Caesarean Section. 7. Local Analgesia. 8. Therapeutic Analgesia and Anaesthesia. Index.

This book is intended as much for the general practitioner or obstetrician with no specialized knowledge of anaesthesia, as for the anaesthetist with no special obstetrical experience.

The anatomical and physiological aspects of normal labour with emphasis on the mode of production of pain are discussed. The current methods of combating pain at the different stages of labour are described with special reference to the effects of drugs on uterine action and the foetal respiratory centre. A well-illustrated section describes in detail the different apparatus used for inhalation analgesia with regard to their simplicity and efficiency.

Of interest is the section on local analgesia, with special reference to extra-dural block. The advantages and disadvantages of this method are discussed and the technique minutely described and illustrated.

It is obviously impossible in a book of this size to discuss all the different methods that might be employed. The author has had wide experience of the subject and in his approach provides a practical solution to problems of analgesia and anaesthesia that arise during a normal or complicated labour.

NEUROANATOMY AND FUNCTIONAL NEUROLOGY

Correlative Neuroanatomy and Functional Neurology. By Joseph J. McDonald, M.S., M.Sc., M.D. and Joseph G. Chusid, A.B., M.D. (Pp. 263, with 177 figures. \$4.00.) California: Lange Medical Publications.

Contents: Section 1. Central Nervous System. Section 2. Peripheral Nerves. Section 3. Principles of Neurodiagnosis. Section 4. Disorders of the Central Nervous System.

The preface to this edition states that it is dedicated to the beginner in neurology. This is a very modest assessment of a work which surveys succinctly the vast field of neuroanatomy and medical and surgical neuropathology. The concise outline format is valuable as an aid to quick reference and the innumerable diagrams simplify the complexities of fibre tracts and areas of innervation. The photographs, on the other hand—particularly those of tumours—contribute little.

Techniques of diagnosis are covered in detail and include representative electroencephalographic tracings, and a discussion of pneumographic and angiographic roentgenological procedures. Infectious diseases of the central nervous system are described in detail and there is a valuable section on muscular atrophies and dystrophies. In view of this broadening of the scope since the time of its original publication as *Correlative Neuroanatomy*, it has now been deemed advisable to change the title to the present one. A less esoteric appellation would have been more suitable for an essentially practical work of undeniable value to neurologist, physician or student.

HUMAN VIRAL AND RICKETTSIAL INFECTIONS

Viral and Rickettsial Infections of Man. Edited by Thomas M. Rivers, M.D. 2nd ed. (Pp. 719 + xvi, with 90 illustrations including 7 plates in colour. 60s.) Philadelphia; London; Montreal: J. B. Lippincott Company. 1952.

Contents: 1. General Aspects of Viral and Rickettsial Infections. 2. Chemical and Physical Procedures. 3. Serologic Reactions in Viral and Rickettsial Infections. 4. Hemagglutination by Viruses. 5. Chick-Embryo Techniques. 6. Propagation of Viruses and Rickettsiae in Tissue Cultures. 7. Epidemiology. 8. Interference Between Animal Viruses. 9. Diagnosis of Viral and Rickettsial Infections. 10. Bacterial Viruses: Bacteriophages. 11. Viral Encephalitides. 12. Rabies. 13. Poliomyelitis. 14. The Coxsackie Group. 15. Infectious Hepatitis and Serum Hepatitis. 16. Common Cold. 17. Primary Atypical Pneumonia. 18. Influenza. 19. Smallpox and Vaccinia. 20. Psittacosis-Lymphogranuloma Group. 21. Trachoma and Inclusion Conjunctivitis. 22. Measles. 23. Rubella. 24. Exanthem Subitum. 25. Diseases Caused by the Virus of Herpes Simplex. 26. Epidemic Keratoconjunctivitis. 27. Varicella-Herpes Zoster Group. 28. Mumps. 29. Infectious Mononucleosis. 30. Colorado Tick Fever. 31. Yellow Fever. 32. Rift Valley Fever. 33. Dengue. 34. Phlebotomus Fever. 35. The Typhus Fevers. 36. The Spotted-Fever Group. 37. Scrub Typhus. 38. Q Fever. 39. Infections of Minor Importance. Bibliographic Index. Subject Index.

This work made its first appearance in 1948 from the Rockefeller Institute with the financial assistance of the National Foundation for Infantile Paralysis. Dr. Rivers, the distinguished Editor, gathered together as contributors the leaders

in almost every branch of the study of viral and rickettsial disease. That this work should immediately become the standard reference work in the field for practising physicians and medical students was inevitable. It made available in one volume not only detailed clinical descriptions but also all the fascinating laboratory techniques and procedures which physics, chemistry, serology and bacteriology have applied to the investigation of these smallest of living organisms.

Since 1948 great strides have been made and the work has been brought up to date by chapters on the newer diagnostic procedures, and on the recently discovered (and now very fashionable) Coxsackie viruses. Descriptions of swineherd's disease and prebilious fever, which are now known to be caused by leptospiral organisms instead of viruses, have been omitted from this edition.

The spectacular improvement in electron microscopy is neatly demonstrated by a comparison between the frontispiece photographs of various viruses, particularly that of the vaccine virus, which appear in both editions.

The book is beautifully printed and illustrated and there is an extensive bibliography at the end of each chapter.

STRESS 1952

Second Annual Report on Stress. By Hans Selye and Alexander Horava, M.D., Ph.D., D.Sc., F.R.S. (Pp. 526.) Montreal: Acta, Inc.

Contents: Introduction. The Stress Concept in 1952. *Part I. General Physiology and Pathology of Stress.* 1. Reviews and Critiques. 2. Definitions and Terminology. 3. The Stressor Agents. 4. Tests for Stress and Resistance. 5. The Adaptive Hormones. *Part II. Special Physiology and Pathology of Stress.* 6. Resistance. 7. Metabolism. 8. General Metabolism. 9. Carbohydrate Metabolism. 10. Lipid Metabolism. 11. Nitrogen Metabolism. 12. Salt and Water Metabolism. 13. Hormones and Hormone-Like Substances. 14. Enzymes. 15. Vitamins. 16. Hemoglobin and Its Derivatives. 17. Glutathione. 18. The Endocrinies. 19. Growth and Bones. 20. Teeth. 21. Joints. 22. Blood Count. 23. Erythrocyte Sedimentation Rate (ESR). 24. Blood-Cludging. 25. Blood-Clotting. 26. Hemopoietic System. 27. Lymph and Lymph-Flow. 28. Cardiovascular System. 29. Kidney. 30. Respiratory System. 31. Muscular System. 32. Nervous System. 33. Sense Organs. 34. Gastro-Intestinal System. 35. Liver. 36. Salivary Glands. 37. Skin and Appendages. 38. Hibernating Gland. 39. Absorption. 40. Connective Tissue. 41. Spreading. 42. Inflammation. 43. Reticulo-Endothelial System (RES). 44. Wound-Healing. Regeneration. Mitosis. 45. Microbes. 46. Serologic Reactions. 47. Neoplasia. 48. Malformations. *Part III. After-Thoughts.* 49. Sketch for a Unified Theory of Medicine. Atlas. References. Index.

This is the second *Annual Report on Stress*, and it indicates clearly the importance and the need for such a concise and comprehensive review of this field of endocrinology which has come to dominate the whole of experimental medicine.

In 1937 the Institute of Experimental Medicine and Research in Montreal published a review containing 30 references. In 1946 the number of references had increased to 698, and in 1950 there were some 5,500 references. In 1951 there were some 3,000 references to works published during one academic year. The present *Report* refers to over 4,000 publications. These facts provide evidence of the great problems in the presentation and accessibility of material with which we are faced. Dr. Selye is to be congratulated on the success with which he has undertaken this important task.

TRICLORETHYLENE ANAESTHESIA

Trichlorethylene Anaesthesia. By Gordon Ostlere, M.A., M.B., B.Chir. (Camb.), D.A. (Pp. 83 + vii. 7s. 6d.) Edinburgh and London: E. & S. Livingstone Limited. 1953.

Contents: 1. History. 2. General Characteristics. 3. Pharmacology. 4. Trichlorethylene in Anaesthesia. 5. Trichlorethylene in Analgesia. Summary. Appendices. Index.

Trichlorethylene has now been in common use for some 13 years. After a promising infancy the drug passed into a troublesome childhood; indeed, it became a problem child of anaesthesia, with cranial nerve paralyses, cardiac arrhythmias and severe episodes of tachypnoea. It seems now to have passed into a healthy adolescence.

In a small but adequate monograph the author has traced this troubled development, showing how difficulties have arisen. It is clear that many troubles were due to excessive concentration of the agent.

This little book will repay careful study by all who would use this agent intelligently for anaesthesia and analgesia.

DISEASES OF CHILDREN

Diseases of Children. Edited by Alan Moncrieff, C.B.E., M.D., F.R.C.P. and Philip Evans, M.D., M.Sc., F.R.C.P. Fifth Edition. (Pp. 1973. £7 for set of 2 volumes.) London: Edward Arnold & Company. 1953.

Contents: *Volume I. Part I. General Considerations.* 1. Vital Statistics and Administrative Aspects. 2. Heredity. 3. Environmental Causes of Congenital Malformations. 4. Growth and Development. 5. Water and Electrolyte Control and Acid-Base Regulation. 6. Clinical Pathology. 7. Treatment with Drugs. 8. Anaesthetics in the Surgery of Children. 9. The Feeding of Infants and Children.

Part II. Diseases of Children. 10. The Newly-Born Baby. 11. Diseases of Nutrition. 12. Disorders of Metabolism Including Inborn Errors of Metabolism. 13. Endocrine Disorders. 14. Irregularities of the Teeth and Jaws. 15. Diseases of the Alimentary Tract. 16. Diseases of the Liver, Gall-Bladder and Pancreas. 17. Diseases of the Nose, Pharynx, Larynx and Ears. 18. Diseases of the Respiratory System. 19. Tuberculosis. 20. Allergy. 21. Congenital Heart Disease. 22. Diseases of the Cardiovascular System.

Volume II. 23. Rheumatism. 24. Blood Disorders. 25. Functional Disorders of the Nervous System. 26. Congenital Mental Defect in Childhood. 27. Organic Diseases of the Nervous System. 28. Diseases of Muscles. 29. Diseases of the Eye. 30. Diseases of Bones and Joints. 31. Orthopaedic Surgery. 32. Medical Diseases of the Urinary System. 33. Surgery of the Uro-Genital System. 34. Venereal Diseases. 35. Infectious Diseases. 36. Diseases of the Skin. 37. Malignant Disease in Children. Appendix: Practical Procedures. Index.

The remarkable progress which has recently taken place in medicine has left its mark on this important text-book dealing with diseases of children. It is gratifying to note that it has now reached its 5th edition with the assistance of a very considerable panel of distinguished and experienced contributors. The Preface indicates the thoroughness of the revision. Completely new sections include those on the causes of congenital malformations, on growth and development, on drug treatment, on kwashiorkor, on endocrine disorders, on disorders of the teeth and jaws, on the alimentary tract, and on congenital heart disease. The chapter on infant feeding is also quite new, its authorship having been changed on the regretted departure to Canada of Dr. Donald Paterson, one of the editors of the last edition. Of the sections extensively revised, often by the association of a new contributor, mention may be made of those on clinical pathology, inborn errors of metabolism, tuberculosis, allergy, mental testing, the treatment of meningitis, medical disorders of the kidney, and venereal diseases. Rearrangement of some sections has brought an up-to-date chapter on vital statistics to be beginning of the book and an amplified collection of practical procedures to the end in an appendix. Neonatal surgery now comes naturally in the section on diseases of the newborn.

The physician confining himself to paediatrics, or the general practitioner, whose field is the whole of medicine, must recognize that paediatrics is not a limited portion of the field of general medicine. It includes almost the whole of general medicine, and in addition the practitioner must bring to bear on the problems he meets the special skill and knowledge required because of the difficulties associated with children and their disorders. For these reasons such a comprehensive reference source is of the greatest importance and usefulness to all those concerned with the handling of children.

NARCOTIC DRUG CONTROL

Narcotic Drug Control. International Conciliation. November 1952, No. 485. (Pp. 489-536. 15 cents.) New York: Columbia University Press. 1952.

Contents: 1. Introduction. 2. Historical Background. 3. Techniques of Control. 4. Current Problems. 5. Conclusion.

International Conciliation is a booklet published monthly except in July and August by the Carnegie Endowment for International Peace. In this particular issue there is a review of the problems facing the international control authorities in the struggle against the abuse of narcotic drugs. The problems are many—medical, scientific, social, economic, legal, diplomatic and political, and new solutions have constantly to be sought.

The information given here deals with the activities of the United Nations in these problems and is based upon expert knowledge of the staff of the Division of Narcotics of that organization.



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CORRESPONDENCE

DISTRICT SURGEONS' FEES

To the Editor: What further has been done about the long-sought increase in part-time District Surgeons' fees?

What, if anything, has been done by the Medical Association to rectify the unjust scale of fees of the Workmen's Compensation Act?

Part-time District Surgeon.

14 March 1953

THE LADY CADE MEMORIAL FELLOWSHIP : GENEROUS SUPPORT BY THE BRITISH EMPIRE CANCER CAMPAIGN

To the Editor: Sir Stanford Cade came to Johannesburg in July 1951, as the visiting Professor of Surgery to the Witwatersrand University, where his skill as a surgeon and as a teacher, and his remarkable personality, very soon made their impression on all who came in contact with him here.

Unfortunately, his visit ended all too soon, owing to the tragic death of Lady Cade.

A few patients whom Sir Stanford Cade had seen, at the request of Mr. A. Lee Macgregor and myself, and with the kind permission of Professor Underwood, in the Surgical Department in the Medical School, presented me with a sum of money to be placed at the disposal of the Surgical Department of the Medical School, to show their appreciation of Sir Stanford's kindness.

The National Cancer Association of South Africa had been considering the advisability of establishing a Prize for a Cancer Essay, to stimulate the interest of undergraduates in the subject of cancer.

This seemed a good opportunity to carry this into effect and the Council of the Cancer Association of South Africa contributed an amount equal to that which has so far been donated and brought it up to £250.

It was not considered that this would provide an adequate sum to offer an attractive enough prize. The matter was mentioned to Sir Stanford Cade's brother, who immediately donated a considerable sum towards this Fund. I was then approached by Mr. Katz, asking for information of our aims and objects in establishing this Fund. The result was that several weeks ago Mr. Katz and several of his friends very generously donated the sum of £2,550.

The National Cancer Association brought the amount which had already been donated with the £2,550 to £5,000.

In the meantime, I had approached Professor Scarff of the Middlesex Hospital, and Honorary Secretary to the British Empire Cancer Campaign, to find out whether the British Empire Cancer Campaign Rules and Regulations would permit it to take part in the formation of this Fellowship.

The response from the British Empire Cancer Campaign was immediate and very generous. It offered to contribute £ for £ without any limit to the amount contributed in South Africa.

There is thus a sum of already £10,000 available for the Lady Cade Memorial Fellowship.

The offer of the British Empire Cancer Campaign is unlimited, and should the National Cancer Association of South Africa, after its appeal to the public for funds this year, be in a position to contribute more to the Lady Cade Fund, then the British Empire Cancer Campaign will again give an equal amount.

It is the hope of the organizers of the Lady Cade Memorial Fellowship to raise sufficient funds to make the Fellowship available for men of senior status interested in cancer.

A Committee has been appointed consisting of Professor Underwood, representing the Witwatersrand University, and myself, representing the National Cancer Association of South Africa, to make suggestions for the organization of this Fellowship acceptable both to the Witwatersrand University and to the National Cancer Association.

It is intended that the Fellowship should be open to any suitable applicant in South Africa or Great Britain, through the Witwatersrand University, but the details have not yet been completely decided.

The object of this letter, however, is to acknowledge the

indebtedness of the organizers of the Lady Cade Fellowship to the very generous and immediate response of the British Empire Cancer Campaign.

It is a remarkable gesture on the part of Professor Scarff and his colleagues of the British Empire Cancer Campaign, and the medical profession and public in South Africa will readily acknowledge their thanks and gratitude, not only to all those who have so far contributed to this fund, to the Council of the National Cancer Association of South Africa, but in particular to the British Empire Cancer Campaign.

X-ray Department,
Chamber of Mines Hospital,
P.O. Box 774,
Johannesburg.
14 March 1953.

M. Weinbren.

CANCER INCIDENCE IN NON-EUROPEANS

To the Editor: We would be grateful for the use of your Journal in requesting the co-operation of your readers.

Under the auspices of the National Cancer Institute of America and the South African Institute for Medical Research, and with some assistance from the Department of Education, Arts and Science, we are conducting a 3-year investigation on cancer incidence among the urban non-Europeans in the Johannesburg area. It is hoped to register all cases of cancer, i.e. carcinoma, mixed parotid tumour, rodent ulcer, brain tumour, sarcoma, leukaemia, etc., whether diagnosed by clinical, radiological or histological methods.

The majority of cancer cases is treated at non-European hospitals but it is possible that some patients attend private doctors for cancer and never come to hospital. We have, therefore, circularized all doctors whose names appear in the classified list of the Johannesburg Telephone Directory asking them if they treat any cancers in non-Europeans without referring them to hospital, and to register such. A fee of 2s. 6d. can be paid for each case of suspected cancer registered.

It is possible that we may have missed some doctors who are handling such cases: if this is so we would be very glad to get their names, and franked addressed registration forms will be sent to them.

Further, if any doctors have not yet returned the circular forwarded, we would be grateful if they would do so whether they see non-European patients or not, in order that our records may be as complete as possible.

J. Higginson and A. G. Oettlé,

Cancer Research Unit,

South African Institute for Medical Research.

P.O. Box 1038,
Johannesburg.
14 March 1953.

LIBRARY : DURBAN MEDICAL SCHOOL

To the Editor: Thanks to the generosity of numerous individual donors as well as of established libraries elsewhere, the Durban Medical School has been successful in building up fairly complete sets of a number of medical journals extending backwards, in some cases, for several decades. We have the following gaps on the shelves where the *British Medical Journal* stands, and shall greatly appreciate it if any colleagues would help us to fill them.

1946 (January-June): Nos. 4435-40 (6 Nos.).

1947 (January-June): Nos. 4494-95.

1952 (January-June): Nos. 4755, 4770-73.

1952 (July-September).

G. W. Gale,

Dean of the Faculty of Medicine,

University of Natal.

P.O. Box 1525,
Durban.
18 March 1953.

S.A. LOGOPEDIC SOCIETY CONGRESS

To the Editor: I have been instructed by the Chairman of the South African Logopedic Society Congress Committee to approach you in connexion with a formal call for papers through your Journal.

The first Speech Therapy Congress makes a formal call for papers to be presented in September at the University of the Witwatersrand. A summary of the proposed papers is to be submitted by 1 June 1953, and addressed to:

Miss D. Ross, Organizing Secretary, S.A.L.S. Congress Committee, Department of Phonetics and Logopedics, University of the Witwatersrand, Milner Park, Johannesburg.

We would like to take this opportunity of thanking you for your co-operation in this matter.

21 March 1953.

(Miss) D. Ross,
Organizing Secretary.
Congress Committee.

CHLOROPHYLL

To the Editor: I wonder if doctors have come across any cases of liver damage as a result of the taking internally of large amounts of Chlorophyll.

It is known that the U.S. Bureau of Standards have cast doubts on the deodorizing properties of Chlorophyll whilst reputable Dental Surgeons are convinced that there is no conclusive evidence that Chlorophyll helps against tooth decay. During the war it was shown that Chlorophyll was not the magic healer of wounds we were led to believe.

A joke now going the rounds, that green aspirin will be sold for 'stinking' headaches, may become a reality with a proper advertising and press campaign. The public will swallow anything.

I personally think that Chlorophyll must be the biggest hoax foisted on the people in this 20th Century.

Guardian Buildings,
33 Adderley Street,
Cape Town.
25 March 1953.

Louis Babrow.

SUPRACONDYLAR FRACTURES OF THE HUMERUS IN CHILDREN

To the Editor: Dr. Cecil Morris, in his article on *Supricondylar Fractures of the Humerus in Children* appearing in the *Journal* of 28 March 1953, deals very well with some of the practical difficulties which often arise in the treatment of this injury.

However, he does not state clearly what to do with the case of the very swollen or 'ballooned' elbow with marked displacement of the fragments. As he states, forcible manipulation of this type of fracture can be dangerous. Open reduction, in my opinion, is seldom needed, and in any case should not be undertaken except by an experienced surgeon working in a well-equipped hospital.

A method which I have found to be quite satisfactory is that described by J. F. Le Cocq and Irwin Slade in 1946, as follows:

The child is given a sedative in bed. Two pieces of adhesive strapping are applied to the forearm, one on each side, from just below the elbow, extending past the hand on to a wooden spreader, so as to leave the fingers quite free. A soft crêpe bandage (never strapping) is applied around the forearm, so as to prevent slipping. The arm is then suspended by the strapping from a stand, such as a transfusion stand, with 3-5 lb. traction in a vertical direction, with the elbow flexed about 45°. A second weight, 1-3 lb., is suspended by means of a small soft sling, proximal to the elbow, so as to keep the humerus almost horizontal. The patient is usually quite comfortable with the arm elevated in this position. The circulation and pulse are easily tested, and active movements of the wrist and fingers is encouraged from the beginning.

An X-ray picture is taken with a portable machine the following day, without disturbing the traction. Frequently this shows a perfect reduction of the fracture, as might be expected from the mechanics of the traction employed.

When the swelling has subsided—usually in about 48 hours—a plaster slab and bandage is applied in bed with the elbow flexed as much as is comfortable and the traction removed.

If the reduction is not perfect, the child is given an anaesthetic in bed and the fracture is easily reduced by gentle manipulation. A plaster slab is then applied and the traction removed.

This method of dealing with difficult supracondylar fractures is safe and almost foolproof and I have found that both the patient and doctor sleep much better!

The only disadvantage is that the patient occupies a bed for 2 or 3 days, which is nothing compared with a crippled elbow or a Volkmann's ischaemic contracture.

REFERENCE

Le Cocq, J. F. and Slade, Irwin (1946). *Northwest Med.*, **45**, 30-32.

W. T. Ross, F.R.C.S.

79 De Villiers Street,
Johannesburg.
1 April 1953.

MEPACRINE IN ARTHRITIS

To the Editor: Some 9 months ago I gave a patient a course of mepacrine gm. 0.1 daily for 30 days as treatment for the pains, swelling and stiffness of rheumatoid arthritis plus osteoarthritis, particularly of both knees and the right elbow.

I had heard through a doctor friend that patients in Northern Rhodesia taking mepacrine noticed that their rheumatic complaints were greatly relieved. This rang a bell and I recalled that when treating the General Officer Commanding the 50th (Northumbrian) Division with myocrisin for rheumatoid arthritis we ran short of this just prior to the invasion of Sicily. The General was very concerned as to whether he would be able to carry on throughout the campaign, especially since we were to be an assault division with the task of storming the beaches at Avola on the morning of D day.

Supplies of myocrisin did in fact become available some 6 weeks later and towards the end of the campaign but were not required because the G.O.C. was so much better. At the time this was put down to the effects of the earlier injections but now on review I feel sure it was due to the mepacrine tablets we were all taking daily. We were operating in the worst malarial area of the Island and actually lost quite a number of troops with malignant malaria. Hence our assiduous application in taking our daily dose.

When we were brought back to the U.K. for the invasion of Normandy we were all as yellow as canaries.

The first arthritis patient I gave mepacrine to stated within a month that she had not felt so agile and free of pain and stiffness for 20 years. I therefore tried it on a few more patients and the difficulty then arose as to what should be a maintenance dose. *Pro tem.* the following appeared to answer, viz. 1 a day for 30 days, then 2 to 5 per week according to requirements.

The next thing one found was that a local chemist was now muscling in and was producing and advertising widely a tablet which seemed to contain mepacrine and probably some salicylamide and was being retailed to the public at 6d. each.

One feels very disgusted at this cashing in and exploitation of the public with an unproved remedy which may be unsuitable for some cases and which may, over a prolonged period, result in some liver damage. For that reason I hope you will be able to give publicity to this matter and would suggest that the time has come when the Government should step in and control such dishonourable trade tactics.

Is it not also urgent that all antibiotics be brought under control, as in the U.K. and only sold on a medical certificate? The increasing ill-effects of the wide-spread use of penicillin lozenges, ointments, etc., in producing intractable conditions of the skin and mucous membrane are a source of worry to most doctors.

Finally can it be said that we doctors are entirely blameless and that the doctor who light-heartedly gives a one-shot penicillin injection may not be inflicting serious injury to his patient's future response to this once valuable antibiotic?

When asking a laboratory for a sensitivity test to antibiotics of a sample of human discharge, pus, etc., how seldom now does penicillin figure in the list?

James Melvin

130 Queen Street,
Cambridge, C.P.
2 April 1953.

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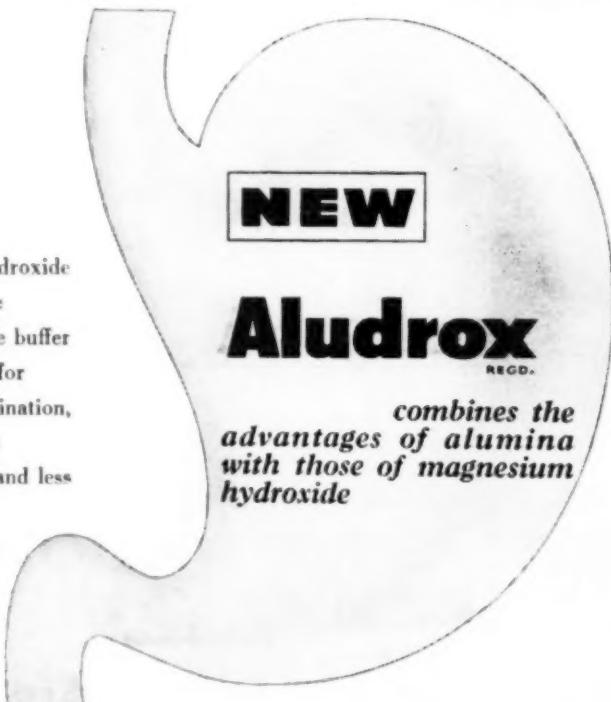
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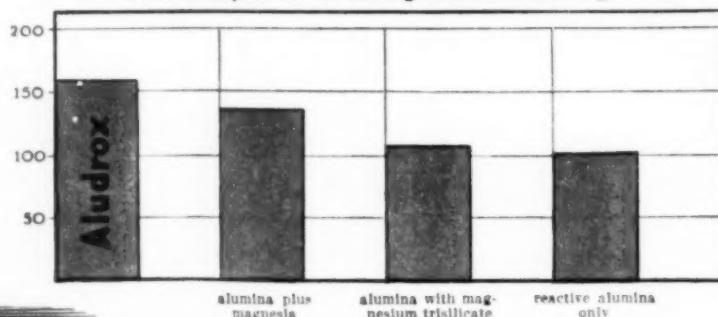
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Die suksesvolle applikant moet op Port Elizabeth in die geneeskundige distrik woon, op 'n datum wat gereel sal word diens aanvaar, en sy pligte ooreenkomsdig die regulasies van die Siekelfonds uitvoer.

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P. J. Klem
Hoofsekretaris

Johannesburg
2 Mei 1953

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The rates are subject to alteration from time to time.

The posts are pensionable and carry the usual civil service conditions and leave privileges, but contract appointments may be considered. Furnished quarters are provided by Government for which there is a rental deduction from salary of 10%.

Annual vacation leave (cumulative) of 6 weeks and 2 weeks occasional (non-cumulative) leave are granted subject to the exigencies of the service.

Except in the case of Public Health appointments, private practice is at present permitted, but an officer is not entitled as a right to practice on his own account. An allowance of £150 in lieu of private practice may be granted to officers employed on public health duties on a full-time basis, and one such vacancy is expected to arise in the near future.

Further particulars and forms of application may be obtained from the Director of Medical Services, P.O. Box 5, Mbabane, Swaziland.



Printed by Cape Times Ltd., Parow, and Published by the Proprietors, THE MEDICAL ASSOCIATION OF SOUTH AFRICA,
MEDICAL HOUSE, 35 Wale Street, Cape Town. P.O. Box 643. Telephone 2-6177. Telegrams: 'Medical' (901)

South African Railways and Harbours Sick Fund

(CAPE WESTERN DISTRICT)

APPOINTMENT OF RAILWAY MEDICAL OFFICER: KLAVER

Applications are invited from duly registered medical practitioners for appointment to the position of Railway Medical Officer, Klaver, and for section of railway line Klaver (inclusive) to Claypan (inclusive), at a salary of £303 per annum, plus the fees and allowances prescribed in the Regulations of the Sick Fund, and with the right of private practice.

The salary will be subject to adjustment in accordance with the census of members to be taken on 1 April of each year.

The appointment will be made in terms of the Regulations of the Fund, and will be subject to termination of four months' notice being given by either side.

The successful applicant will be required to reside in the medical district, to take up the appointment on a date to be arranged, and to carry out his duties in accordance with the Regulations of the Fund.

Applications should reach the District Secretary, Cape Western District Sick Fund Board, Security Building, Exchange Place, Cape Town, not later than 23 May 1953, and should state:

1. Full name.
2. Qualifications (when and where obtained).
3. Experience (when and where obtained).
4. Date of birth.
5. Country of birth.
6. Whether single or married.
7. Whether fully bilingual.
8. Whether South African citizen.
9. What Government appointment, if any, is held.

Canvassing by or on behalf of any applicant is liable to disqualify such applicant.

Any further particulars may be obtained from the District Secretary at the above address, on application.

P. J. Klem
General Secretary

Johannesburg
2 May 1953

Basutoland Government

VACANCY FOR MEDICAL OFFICER

Applications are invited from registered medical practitioners for the above pensionable post, on a salary scale of £865—£865—£935 × 35—£1,005 × 45—£1,140 × 45—£1,320 per annum. Entry point on this scale is determined by war service and/or previous experience. Cost-of-living allowance is payable; the present rates are:

Married Officers: On the first £800 of salary—12½%; on the remaining salary—7½% with a maximum of £132 per annum.

Single Officers: One half of the above rates, subject to a maximum of £66 per annum.

Rental deduction of 10% of salary for furnished quarters.

Annual vacation (accumulative) leave of 6 weeks and 2 weeks occasional (non-accumulative) leave are granted, subject to the exigencies of the service. Biennial warrant to the coast. Overseas leave passage allowance for officer, wife and proportionate allowance for children every tour of 3 years.

Private practice is at present allowed but is subordinate to official duties.

A knowledge of practical surgery will be an advantage.

Initially the successful candidate will be required to be Relieving Medical Officer.

The climate is healthy and the Territory free from tropical diseases.

Applications should be forwarded to the Director of Medical Services, Maseru (from whom further particulars may be obtained) by 9 May 1953.



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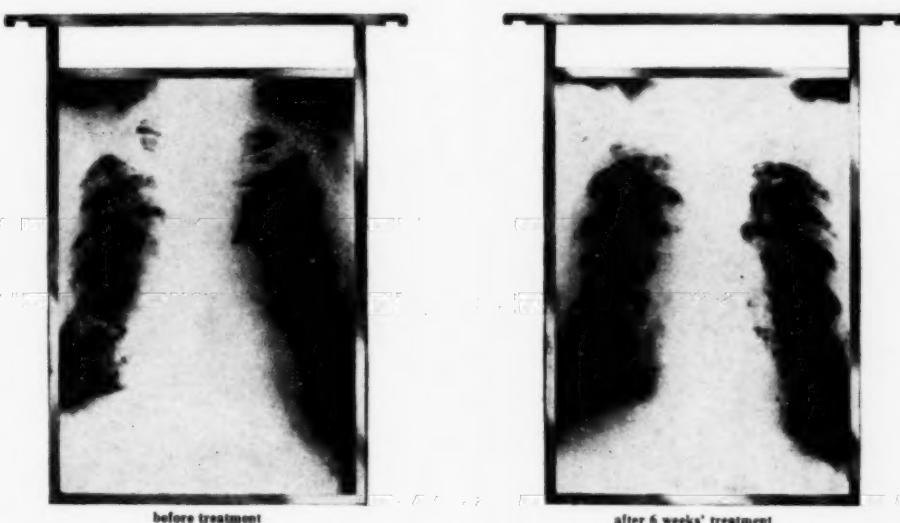
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